Third Edition

THE FUTURES GAME

Who Wins? Who Loses? And Why?

Richard J. Teweles
Frank J. Jones

Edited by
Ben Warwick

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Dedicated to
Lauren Teweles
Aaron Teweles
Kari Teweles

Dedicated to
Roni, Ryan, and Andy Jones

To my wonderful family
Jana
Troy
and Ethan Warwick

CONTENTS

Chapter 3

The Mechanics of Futures Trading 70

Chapter 4

The Behavior of Futures Prices 105

PART TWO

PLAYING THE GAME—TRADING 137

Chapter 5

Approaches to Trade Selection: Fundamentals 139

Chapter 6

Approaches to Trade Selection: Technical Analysis 154

Chapter 7

Spreads 191

Chapter 8

Options 211

PART THREE

LOSERS AND WINNERS 305

Chapter 11

Who Wins? Who Loses? And Why? 307

PART FOUR

THE BROKER IN THE GAME 333

Chapter 12

Building, Maintaining, and Servicing a Futures Clientele 335

Chapter 13

Compliance: I'll See You in Court 355

PART FIVE

CHOOSING THE GAME—MARKETS 373

Chapter 14

General Sources of Information 375

Chapter 15

The Interest Rate Futures Market 388

Chapter 16

The Foreign Currency Futures Markets 400

Chapter 17

Grains and Oilseeds 418

Chapter 18

The Meat Futures Contracts 469

Chapter 19

Precious and Industrial Metals 509

Chapter 20

The Energy Markets 544

Chapter 21

The Food, Fiber, and Wood Products Markets 566

Chapter 22

Index-based Futures Contracts 632

PREFACE

"It is in games that many men discover their paradise."

—Robert Lynd

In the eleven years since the second edition of *The Futures Game,* the futures and options industry has experienced substantial growth. Financial futures now dominate the landscape; several exchanges have merged; and commission rates have fallen significantly, making the futures markets even more useful tools for hedging and speculation.

Homage must be made to those authors who blazed the path. The first edition of *The Futures Game* was hailed as an unbiased, pragmatic study of a much maligned industry. Many participants in the futures markets, including myself, have used *The Futures Game* as an invaluable reference tool. The work of Richard J. Teweles, Frank J. Jones, Charles V. Harlow, and Herbert L. Stone serves as the groundwork for this edition; the bulk of their more timeless comments have been left in their original form.

I also wish to thank those who make a revision of this magnitude possible. Special thanks must be given to Adam Whitehead and Richard Bornhoft, two persons without whom this book would have never been possible. I would also like to thank Carla Cavaletti, Randy Lambeth, and the members of the Bornhoft Group team—Bill Entwistle, Chad Leavitt, Ron Montano, Bernard Wilkinson, Terry Newcomb, Lisa Reeve, Bob McMorris, Russ Nuzum, Sharon Lamont, and Debra Baggett—for their consideration during the revision process.

Ben Warwick

THE FUTURES GAME

PART ONE

BASICS OF THE GAME

A stock and a futures trader were good friends and compared notes often on trading philosophies. When the stock trader fell on bad times with a series of losses, he was forced to sell his membership. Before leaving for another line of work, he reflected with his futures trading friend. "Your trouble is that you weren't over here with me trading futures," confided the friend. "But I don't know anything about futures," the crestfallen stock trader replied.

In one way or another the advice "You've got to know the territory" has been proffered for centuries. The four chapters in this part are an effort to introduce the reader to "the territory" of futures trading.

In Chapter 1—"Why Trade Futures?"—the idea of speculation, as well as the specific evolution of trading in futures, is discussed. Because many potential futures traders have had experience in securities, specific similarities and differences in the two areas are noted.

Chapter 2, "The Nature of the Futures Markets," places the trader in the environment in which he is to operate. The nature of contracts, the markets for those contracts, who plays the game, and the nature of cash and futures prices are discussed in order that the trader may appreciate the relationships involved in the market and trader performance.

Chapter 3, "The Mechanics of Futures Trading," helps the trader to choose a broker and to understand clearly the procedures of opening and maintaining a futures account. Contract information, types of orders, regulatory requirements, and tax considerations are not heady stuff, but avoiding problems in these areas is imperative.

Chapter 4, "The Behavior of Futures Prices," lays the vital groundwork for a clear understanding of the behavior of prices, the relation between past and future price changes, and the question of trends.

1

CHAPTER

Why Trade Futures?

"A speculator is a man who observes the future, and acts before it occurs."

—Bernard Baruch

INTRODUCTION

This is a book about trading futures. Trading is an activity that cuts across many disciplines—economics, mathematics, sociology, statistics, and psychology are among the most obvious. Futures trading is carried on by individuals involved in related cash markets as well as by floor traders and speculators. Speculators account for more than half the dollar value of the open interest in futures, yet there are few other fields in which there is more interest and less knowledge among the participants.

In this first chapter the economic role of the speculator and the history of trading from its Phoenician beginnings are presented. Attacks on trading as an institution are described, and speculation as an activity is analyzed, as are the specific differences between futures and securities. A final section—"Should You Speculate?"—leads the trader to considerations that, although personal, must include general criteria.

ECONOMIC FUNCTION OF THE SPECULATOR

The usual justification made for speculation in futures is simple. Futures trading is beneficial to the public which ultimately consumes the goods traded in the futures markets. The benefit most often considered primary is the probability that hedging allows the risk of price changes to be shifted; hence the costs of production, marketing, and processing are reduced. If this is true, and if the cost savings achieved are passed on to consumers, futures trading will benefit the consumers on whose behalf the economy is supposed to function. Futures markets provide other important benefits, such as continuous, accurate, well-publicized price information and continuous liquid markets. Without the speculator futures markets could not function; therefore, if the futures markets operate for the social good, the speculator who makes the operation possible must also contribute to the social good. Speculators attempt to anticipate what prices are going to do and, by taking appropriate positions in the futures markets, make a profit if their judgment proves correct. They may or may not be correct and therefore may or may not make a profit, but in their very efforts to do so they do enough trading to provide the necessary base for liquid futures markets and thereby raise the efficiency of commodity marketing. Sometimes speculators are accused of making markets unstable by virtue of their speculation, but it is not necessary for them to prove that they earn their profits, if they do earn any, by stabilizing or destabilizing prices; they earn the opportunity to profit merely by being in the market, hence making the market possible. Furthermore, there is no proof that speculators not engaged in manipulation destabilize prices. Several studies have demonstrated that the speculator probably moderates rather than accentuates price volatility.[1] It is not unusual for cash markets to demonstrate greater price volatility when futures market volume and open interest are low than when they are high.

Not only is the volume of business done by trade hedgers at any given time frequently too small to provide the liquidity necessary for an efficient market, but a preponderance of hedgers frequently tends to want to buy at the same time or sell at the same time, and part-time speculators, along with professional traders and arbitrageurs, are needed to take the other side of some of these trades.

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[1] One of the more recent studies include "Managed Futures Trading and Futures Price Volatility" by Scott Irwin and Satoko Yoshimaru (Washington, D.C.: Managed Futures Derivative Foundation, 1996).

SPECULATING OR GAMBLING?

There are many who regard "speculation" and "gambling" as synonymous terms. One hears of "investing in securities" and "gambling in futures." Even some relatively sophisticated investors consider futures trading to be one step removed from a Nevada casino. Others regard speculation and gambling as distinctly different activities. The usual differentiation is based on the nature of risk and the social good. Gambling involves the creation of a risk for the sole purpose of someone taking it. The horse race, poker game, and roulette wheel themselves create risks that would not be present without them. Gamblers are willing to accept these risks in return for the opportunity to win some money. No particular social good is accomplished unless one believes that gambling provides a needed outlet for the gamblers whose needs might be satisfied by something worse if they could not gamble.

Speculation is nothing more than an investment in which the realized rate of return may vary substantially from the expected rate of return. The terms "speculation" and "investment" cannot really be differentiated clearly from one another but rather represent the same activity, differing only in the degree of possible variation from expected returns. It is not accurate to differentiate between these terms solely on the basis of the length of time during which they will be held or the forms taken by returns. Both the intrinsic volatility of the asset and the amount of leverage utilized by the holder contribute to possible variation in expected returns.

Unlike gambling, speculation deals in risks that are necessarily present in the process of marketing goods and services in a free capitalistic system. As a soybean crop grows and is harvested, concentrated, and dispersed, the obvious risks of price changes must be taken by those who own the soybeans or have commitments to buy them, either in their original form or as oil or meal. These risks would be present whether futures markets existed or not. If the speculator were unwilling to take them, someone else would have to do so. Unlike the gambler who causes a game to be created merely to satisfy a desire to gamble, the speculator does not inject risk into the economy merely because of a desire to speculate.

The truth of the matter seems to lie somewhere between these two points of view. If hedgers operated in the futures markets solely to reduce their risks and passed their savings on to consumers, and if speculators made this all possible, there could be little quarrel with the argument that their services had social value. Actually, hedgers operate in the futures markets primarily to increase their profits and not just to reduce their risks.

If they believe that to hedge against their inventories or to make forward sale commitments is the best course of action, they will do so. If they believe that a partial hedge is adequate, they might well hedge only part of their risk. In some cases, if they are quite certain that their judgment of the future course of prices is correct, they might carry their entire risk unhedged. Such selective hedging is far more common than is implied in many standard texts, which indicate that all risks are hedged and that most hedges work perfectly or nearly so.

Furthermore, many firms are not above attempting to take advantage of apparent opportunities in the futures markets by taking positions parallel with their cash positions—which, of course, amounts to speculations that increase risk rather than hedges that reduce it. If such speculation is successful, it works for the good of the company and its owners, and insofar as the economy is benefited by the health of companies and their owners, it is also benefited by the speculation. If speculation of this kind proves unsuccessful, however, and the company, its owners, and its customers are damaged, it is difficult to argue that the speculators who took the other side of the trade and made it possible benefited anybody.

The motivation of many individual speculators could well be identical with that of gamblers; that is, they are willing to take relatively large risks in return for the chance to gain large profits. In addition, they may derive some pleasure from the activity of trading, just as the gambler derives excitement from the game and not just from the monetary result of gambling. The major difference is that the activities of futures speculators are essential to hedging, which, on balance, is apparently beneficial to the social good.

THE EVOLUTION OF FUTURES TRADING

Trade carried on over great distances is an ancient activity of the human race. The great trade networks of the Phoenician, Greek, Roman, and Byzantine empires were primary sources of economic power for these old civilizations. Although much trading was done on barter or cash-and-carry bases, the Greek marketplaces and Roman trading centers utilized such characteristics of modern trading as fixed times and places to trade and even contracts for future delivery.[2]

The decline of the Roman Empire in Europe resulted in the rise of disorganized and hostile European feudal states. This system of self-

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[2] Lloyd Besant, ed., *Commodity Trading Manual* (Chicago Board of Trade, 1982), pp. 1–4.

sufficient feudal manors undermined the basic exchange of goods among peoples of widely separated lands. When the urban tradition of Rome disappeared in early medieval Europe, only a few cities in the south of France and in Italy retained their ties with distant Eastern trade depots. During the Middle Ages economic and political stability slowly returned. In the eleventh and twelfth centuries several feudal monarchs succeeded in expanding their land holdings and their authority and thereby sowed the seeds of the modern European state system.

By the twelfth century two great trading centers had begun to flourish on the European continent as a result of a general revival in trade. In northern Italy the cities of Venice, Florence, Genoa, Pisa, and Milan competed for trading rights with the Orient and also sought to expand their trade throughout Europe. At the same time northern European trade centered about the region of Flanders (now Holland and Belgium). This area, known since Roman times for its fine cloth, developed strong economic ties with England, which was then the most important wool-producing area in Europe. The Italian traders, specializing in such luxuries as fine silk, spices, rare metals, and exotic perfumes, crossed the paths of the Flemish traders of cloth, wine, salt fish, lumber, and metalware on land held by the Counts of Champagne. Evidence shows that as early as 1114 the Counts of Champagne had established trade fairs to encourage mercantile activity from which they extracted fees. It was at these markets in Champagne during the twelfth century that the first use of forward contracts in Europe probably occurred.[3]

Once established, the market fairs became the chief centers of international exchange in Europe. Traders came not only from Flanders and Italy but from Scandinavia, England, and even Russia. The Counts of Champagne provided the traders with protection, money changers, and even storage facilities. Trade fairs were eventually held on a year-round basis, rotating initially among several raw materials and manufactured goods but eventually specializing in only one or a few related commodities; for example, linen and wool at Troyes and leather and skins at Reims.[4]

Generally, the last few days of each fair were reserved for paying bills and settling the bargains struck during the fair. Because traders at the fairs often came from widely dissimilar geographic and ethnic back-

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3. J. K. Sowards, *Western Civilization to 1660* (New York: St. Martin's Press, 1965), pp. 10, 384, and 391; Lee Dee Belveal, *Commodity Trading Manual* (Chicago Board of Trade, 1966), p. 3-a.
4. Henry H. Bakken, *Theory of Markets and Marketing* (Madison, Wis.: Mimir Publishers, 1952), p. 317.

grounds, disputes often arose over the settling of accounts, and because of these disputes a code of commercial law, called the "law merchant," was slowly developed. Violators of the code were taken before "courts of the fair," which were composed of the merchants themselves.

This emerging medieval code of mercantile law performed much the same function as the regulations established by today's commodity exchanges. It defined contract terms; determined methods of sampling, inspecting, and grading the commodity in question; and set down location and date for delivery of the goods. Although most transactions were of a spot nature, an innovation of the medieval fairs was the use of a document called a *lettre de faire* as a forward contract which specified the delivery of goods at a later date.[5] Although these *lettres de faire* were first issued only in the sale of cash commodities between a single buyer and seller, they later evolved into negotiable documents which might be transferred to several parties before arriving at the warehouse where the specified goods were stored. Because of the difficulties of travel, many merchants preferred to bring only samples of their merchandise to the fairs, and the *lettre de faire* helped to make trade by sample satisfactory to both buyer and seller. Its functions became similar to the bill of exchange widely used today.[6] In addition, it had some characteristics of the modern warehouse receipt. Signed by a reputable merchant in a distant city to indicate that a specified commodity was being held in his warehouse, the receipt (*lettre de faire*) could be sold to a third party, who would, in turn, either sell or take possession of the purchased goods. The forward contract trading by merchants in the late Middle Ages was in many respects like the modern commodity futures contract, but differed in that the forward trades were not standardized and were consummated on a more personal basis.

Following the establishment of the Champagne market fairs, and later others like them at Bruges, Antwerp, and Amsterdam, and the proved viability of the representative sample as the basis for a commodity transaction, England created year-round meeting places at which traders could buy and sell commodities and manufactured goods. These meeting places were known as exchanges, an early example being the Royal Exchange opened in London in 1570. The Royal Exchange was later divided into specialized exchanges known as a group as the London Commodity Exchange.

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5. W. C. Labys and C. W. J. Granger, *Speculation, Hedging, and Commodity Price Forecasts* (Lexington, Mass.: D. C. Heath and Co., 1970), p. 3.
6. Belveal, loc. cit.

Dealers soon began acting in the London commodity exchanges as intermediaries willing to absorb price risks that the merchants wished to avoid in return for the opportunity to profit in forward transactions. Although spot, or cash, trades remained the essential part of the market, increasingly large numbers of traders took advantage of the forward contracts.

As the system evolved, sellers sold their goods to intermediaries, who would, in turn, seek out a prospective buyer. In this way sellers were almost certain to dispose of their goods at reasonable prices, and buyers could expect standardized levels of quality from dealers who offered goods for resale. At this point in the development of the marketing process grading systems and true futures contracts had not yet been devised, but they were on the horizon.

DEVELOPMENT OF THE FUTURES CONTRACT

The first recorded case of organized futures trading occurred in Japan during the 1600s.[7] Wealthy landowners and feudal lords of Imperial Japan found themselves squeezed between an expanding money economy in the cities and their primarily agrarian-based resources. The rents that they collected from their feudal tenants were paid in the form of a share of each year's rice harvest. This income was irregular and subject to uncontrollable factors such as weather and other seasonal characteristics. Because the money economy required that the nobility have ready cash on hand at all times, income instability stimulated the practice of shipping surplus rice to the principal cities of Osaka and Edo, where it could be stored and sold as needed. In an effort to raise cash quickly, landlords soon began selling tickets (warehouse receipts) against goods stored in rural or urban warehouses. Merchants generally bought these tickets in anticipation of their projected needs (they also suffered at times from the fluctuations of uncertain harvests).[8]

Eventually "rice tickets" became generally acceptable as a form of currency to facilitate the transaction of business. At times, however, stored rice reserves were inadequate to meet the needs of the nobility, and when this happened, many merchants extended credit at interest to the landlord before the actual sale of the rice tickets.

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[7] Henry H. Bakken, "Futures Trading—Origin, Development and Present Economic Status," *Futures Trading Seminar,* **II** (Madison, Wis.: Mimir Publishers, 1953), p. 9.

[8] Ibid., p. 10.

During the late seventeenth century the Japanese Dojima rice market was characterized by the fact that only trading in futures contracts was permitted. By 1730 the Tokugawa Shogunate, or Imperial government, designated and officially recognized the market as *cho-ai-mai,* or, literally, "rice trade on book." A number of rules of the *cho-ai-mai-kaisho* (the marketplace) were strikingly similar to the rules of modern American futures trading[9]:

1. Contract term duration was limited.
2. All contracts within any term were standardized.
3. A basic grade for any contract period was agreed on beforehand.
4. No contract could be carried over into a new contract period.
5. All trades had to be cleared through a clearinghouse.
6. Every trader had to establish a line of credit with the clearinghouse of his choice.

The major difference between the *cho-ai-mai* market and today's futures market was that delivery of cash commodities was never actually permitted. This "futures trading only" concept caused the futures cash-price relationship to function improperly and resulted in erratic price fluctuations. In 1869 this discrepancy between prices in the spot (cash) market and those of the futures market prompted the Imperial government to order trading stopped. Testifying to the essential futures trading function of maintaining an orderly market, fluctuations in the cash price of rice reached chaotic proportions less than 2 years after the discontinuance of the *cho-ai-mai* futures market, and a disgruntled Imperial regime was forced to reopen it.[10] Significantly, physical delivery of goods was then allowed, and as a result the Japanese futures market was effectively wedded to the cash market, thus eliminating its initial instability.

It appears that the practice of tying the cash market to the futures market in Japan may have been influenced by Western trading practices on the Oriental rice-ticket market. As the economy in the United States expanded during the early part of the nineteenth century, commodity exchanges evolved from unorganized club-type associations into formalized exchanges, the first of which was the Chicago Board of Trade, established in 1848 with 82 members. Trading in Chicago was encouraged

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[9] Ibid., p. 11.

[10] Labys and Granger, op. cit., p. 6.

considerably by the trading standards, inspection system, and weighing system prescribed by the board.

It was on the Chicago Board of Trade on March 13, 1851, that the first time contract was recorded. This contract authorized the delivery of 3000 bushels of corn to be made in June at a price 1 cent per bushel below the March 13 price.[11]

The major commodity exchanges in the United States were established and are still situated in Chicago and New York. These sites were logically chosen because of their proximity to the major transport routes. New York, with its port located on the major ocean shipping routes, was ideally suited for international trade. Chicago, situated at the hub of rail and canal routes extending into the agricultural heartlands of the United States, inherited the bulk of internal trade.

Around the mid-nineteenth century forward contracts known as "to arrive" contracts, similar in nature to the medieval *lettre de faire,* gradually made their appearance. It was the accumulation of excess supplies at some times and their shortage at others in the expanding American money economy that caused the modification of the traditional cash-and-carry transaction. The first of these time contracts was not much more than a verbal agreement or a simple memorandum exchanged by both parties.

Because of the increase in the volume of trading at Chicago, the risk in forward contracts became too great to be transferred to intermediaries or specialized dealers, which was the common practice in the London markets at the time, but if another kind of intermediary—a third party—could be induced to assume the risk, the effect would be the same: namely, the assurance of a fair price for the seller and a reasonably uniform quality of product.

Although the first "to arrive" contracts were not transferable, the printed documents that were developed to specify the grade, quantity, and time of delivery of the goods soon were.[12] These alterations to the "to arrive" contracts resulted in the creation of a futures market in this country in which a contract was readily tradable before delivery. The intermediary drawn into the newly evolved marketing structure in the United States was the speculator, on whom the risk was placed.

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[11] H. S. Irwin, *Evolution of Futures Trading* (Madison, Wis.: Mimir Publishers, 1954).

[12] Bakken, op. cit., p. 104.

Because of the volume of the futures contracts traded at Chicago and the replacement of the London-type dealer by the speculator, additional rules for orderly and fair futures trading had to be drawn[13]:

1. The commodity selected for trading had to be easily graded.
2. The grading of commodities had to be maintained by regular governmental inspection.
3. Payment had to be set at the time of delivery.
4. Prices had to be reported openly and be equally accessible to all traders.
5. Buyers and sellers were required to establish financial responsibility.
6. The number of buyers and sellers had to remain large enough to provide continuous opportunities for trade.

As already noted, the rules established in Chicago were much like those of the Japanese rice futures market of earlier date.

Futures trading on the Chicago Board of Trade quickly reached sizable proportions and was rapidly adopted by other exchanges. In New York futures trading had begun on the New York Produce Exchange and on the New York Cotton Exchange by 1870. That same year futures trading was initiated on the New Orleans Cotton Exchange, and by 1885 the New York Coffee Exchange was actively trading in futures. Since the second half of the nineteenth century a number of other commodity exchanges have been founded.

During America's history of futures trading some commodities, such as wheat, have retained their popularity with the trading public. Others, such as silk, butter, and pepper, have lost favor because of insufficient trading volume for a variety of reasons. Some, such as cotton and coffee, suffered a loss of public interest for a number of years but regained popularity later. Financial futures attained widespread acceptance quickly after their introduction and have maintained a high level of activity. The American futures market has developed into a vast and complex institution consisting of 11 exchanges and a large clearinghouse system. Trading takes place in about 150 futures contracts. There are constant additions to and deletions from the list of contracts traded as exchanges seek new sources of business or eliminate new contracts which have failed to attract or which lose industry and public support.

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[13] Labys and Granger, op. cit., p. 6.

With the exception of a short period during World War II, when the markets were closed, the growth of this institution has been continuous since about 1865 and in recent years has accelerated enormously. The history of futures trading in the United States, however, has not been problem-free.

ATTACKS AGAINST FUTURES TRADING

Futures trading has been subject to varying degrees of criticism as long as it has been in existence. Opposition grew particularly severe during the 1890s, when considerable legislation was proposed to restrict loose business practices of many kinds. In Germany all futures trading in grains was actually forbidden by a law passed in 1896, although the law was repealed 4 years later.

In the United States commodity exchanges were widely considered to be gambling dens full of parasitic speculators who drained off money that should have gone instead to producers or consumers of products. There were, and sometimes still are, attempts by the federal and certain state governments to abolish futures trading in whole or in part. In 1867 the Illinois Legislature passed an act that provided that the parties to futures contracts, referred to in the act as gambling contracts, should be fined $1000 and imprisoned up to 1 year in the Cook County Jail. Seven members of the Board of Trade in Chicago were actually arrested under this act. Although it was repealed the following year, many more than 100 other bills to abolish futures trading have been introduced in the United States Congress alone.

In 1890 one Congressman, Butterworth of Ohio, introduced a bill to place a prohibitive tax on dealers in futures, and, during the ensuing debate, Representative Funston of Kansas described the futures market as follows:

> Those who deal in "options" and "futures" contracts, which is mere gambling, no matter by what less offensive name such transactions be designated, neither add to the supply nor increase the demand for consumption, nor do they accomplish any useful purpose by their calling; but on the contrary, they speculate in fictitious products. The wheat they buy and sell is known as "wind wheat" and doubtless for the reason that it is invisible, intangible, and felt or realized only in the terrible force it exerts in destroying the farming industry of the country.

Although Congressman Butterworth's bill failed to pass, agitation continued, and in 1892 Senator Washburn, speaking in the United States Senate, asserted:

> As near as I can learn, and from the best information I have been able to obtain on the Chicago Board of Trade, at least 95% of the sales of that Board are of this fictitious character, where no property is actually owned, no property sold or delivered, or expected to be delivered but simply wagers or bets as to what that property may be worth at a designated time in the future. . . . Wheat and cotton have become as much gambling tools as chips on the farobank table. The property of the wheat grower and the cotton grower is treated as though it were a "stake" put on the gambling table at Monte Carlo. The producer of wheat is compelled to see the stocks in his barn dealt with like the peas of a thimblerigger, or the cards of a three-card-monte man. Between the grain-producer and loaf eater, there has stepped in a "parasite" between them robbing them both.[14]

Another bill that would have imposed a prohibitive tax on all futures trading in farm products failed to pass Congress in 1893 only because final action before Congress adjourned required a suspension of the rules of the House of Representatives and the necessary two-thirds majority vote failed by the narrow margin of 172 to 124. A similar bill considered by the next Congress actually passed the House but this time failed to gain approval of the Senate.[15]

Almost all the bills designed to abolish or restrict futures trading died before reaching a vote or were defeated. After World War II, however, the continuing demands for restrictive legislation were largely concentrated on two unrelated markets: onions and potatoes. In both cases the futures markets were blamed for causing wide fluctuations in prices that inflicted severe losses on the producers, processors, and marketers of these products. In previous attacks on futures trading those engaged in the production and marketing of the products traded were among the most vocal defenders of the futures markets. This time they were among the attackers. In particular, trading in onions was attacked by those who were supposed to benefit from the existence of the market as well as by the usual unsuccessful speculators. The market had few defenders other than the Chicago Mercantile Exchange, whose members did not relish losing the futures market in one of the products traded exclusively on that exchange.

After several years of argument Congress passed a bill in 1958 to prohibit futures trading in onions. The onion crop is a minor one, grown

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[14] From a speech entitled "Regulation and Supervision of Futures Trading," by Bernard P. Carey, chairman, Chicago Board of Trade, delivered at a futures trading seminar April 28–30, 1965, at the Chicago Board of Trade.

[15] Holbrook Working, "Futures Markets under Renewed Attack." Reprinted from *Food Research Institute Studies,* 4, No. 1 (1963).

only in limited areas, but those engaged in the business of trading futures did not take the prohibition lightly. The Chicago Mercantile Exchange appealed to a United States District Court to get the prohibition set aside as unconstitutional, but the attempt failed. Some believe that those engaged in the onion trade who attacked futures trading were really concerned, as they maintained, about the wide fluctuations in price. Others believe that they were actually more interested in having accurate price information somewhat less publicized in order to capitalize on the ignorance of the farmers and consumers. The truth will probably never really be known, but there is some suspicion that the latter provided at least some basis for the trade's lack of enthusiasm for the futures market.

Perhaps the most studies ever done on the effects of volatility on markets due to futures trading followed the stock market crash of October 19, 1987. One focus of the studies has been whether the method of trading stocks, index futures, and options contributed to the market decline. The use of the futures market for dynamic hedging sales, coupled with index arbitrage (the combination of which is commonly referred to as "program trading") could have driven stock index futures below their equilibrium prices, thus leading to a market meltdown. This mispricing in turn could have led index arbitrageurs to buy the low-priced futures and sell the stocks underlying the index. These arbitrage transactions would thus lead to further downward pressure on stock prices and continued selling of index futures, repeating the downward spiral.

There is no conclusive evidence that this spiral took place on October 19, 1987. The Brady Commission (a task force created by President Reagan to study the causes of the crash) found that only 20 percent of futures transactions were related to program trading on that day. External factors such as the severe market downturn in the London and Tokyo markets were not futures-related, since those markets did not have comparable program trading mechanisms at that time. Thus, futures trading—index arbitrage and portfolio insurance—in and of itself does not seem to have been the primary cause for the market decline on October 19, 1987.[16]

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[16] Raymond M. Leuthold, Joan C. Junkus, and Jean E. Cordier, *The Theory and Practice of the Futures Markets* (Lexington, Mass.: Lexington Books, (1989), p. 266. Other important references include: Burton Malkiel, "The Brady Commission Report: A Critique." *The Journal of Portfolio Management* (Summer 1988), 9–13; Sanford J. Grossman, "Report on Program Trading: An Analysis of Interday Relationships" (December 18, 1987); F. R. Edwards, "Studies of the 1987 Stock Market Crash: Review and Appraisal," Working Paper, CSFM168, Center for the Study of Futures Markets, Columbia University, 1988.

Although the equating of speculation in the futures markets with gambling is somewhat illogical, there were other reasons for the hue and cry. There has always been a widespread feeling that profits from speculation are somehow immoral, compared with profits from other seemingly more productive activities, although the concept of compensation received by other risk bearers, such as insurance companies, does not seem to cause similar resentment. This is the same sort of vague opposition that many people feel toward selling a future or security short. Somehow they believe that a price going up is good and a price going down is bad and, furthermore, that the short seller not only thinks that it will go down but makes it do so by selling short.

Like all businesses, futures trading is not without its "rogues." Trading scandals are typically associated with large amounts of press coverage, followed by diatribes by academicians and government officials calling for regulation of the derivatives industry. The following list represents some of the more recent trading scandals[17]:

Trader	Firm	Trading Loss	Market
Nicolas Leeson	Baring Bank	$1.4 billion	Nikkei futures
Toshihide Iguchi	Daiwa	1.1 billion	Treasury bond futures
Robert Citron	Orange County	2.0 billion	Interest rate derivatives
David Askin	Granite Fund (hedge fund)	0.5 billion	Mortgage derivatives
Metallgesellschaft		1.0 billion	Crude oil futures
Juan Pablo Davila	Chilean	1.0 billion	Copper futures
Victor Gomez	Chemical Bank	0.1 billion	Mexican peso
Yasuo Hamanaka	Sumitomo Bank	2.6 billion	Copper futures

It is interesting to note that even with these unfortunate occurrences, the academic justification for futures markets remains strong. The documented benefits to the U.S. economy include helping farmers hedge price risk; allowing corporations to manage their portfolios of assets and liabilities more effectively; and providing the ability to borrow in the cheapest capital market, domestic or foreign, without regard to the currency in which the debt is denominated or the form in which interest is paid.[18]

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[17] Victor Niederhoffer, *The Education of a Speculator* (New York: John Wiley & Sons, 1997), p. 142.

[18] Donald L. Horowitz and Robert J. Mackay, "Derivatives: State of the Debate" (October 1995), study sponsored by the Chicago Mercantile Exchange.

Considerable research has been done in an attempt to prove that speculation does or does not cause excessive price movement. No final conclusions can yet be drawn on this subject, but the weight of evidence indicates that speculation probably does more to smooth price fluctuation than to increase it. There is no doubt that the presence of speculative traders results in more transactions than would take place without their activities, but to conclude that more transactions in themselves cause more price variation than there would otherwise be is unwarranted by the facts.

WHY DO SPECULATORS SPECULATE?

The specific motivation or combination of motivations of all the millions of speculators could not be discussed here in any detail even if reliable data were available. The broad incentives that attract most speculators are quite clear, however, and can be summarized briefly.

Certainly the greatest is the opportunity to make an important amount of money in relation to the capital base used. Not many speculators are naive enough to compare their activities with those of more conservative investors. Most of them are well aware of the risks that they take in return for the large and quick profits possible, although there are some who, like gamblers, are so convinced that they will win that they are unable to admit even to themselves that they might lose. Most of them learn all too quickly that it is a rare opportunity indeed that provides an important potential profit without an attendant large risk.

A recent study found that the typical speculator is an affluent businessperson who frequently invests in the stock market. To such a trader, winning or losing on a particular trade is more important than the size of the win or loss. Thus, the trader consistently cuts profits short while letting losses run. The trader also worries more about "missing a big move" in the market by being on the sidelines than about losing by being on the wrong side of a market move (in other words, being "in the action" is more important than the financial consequences). Participating brokers confirmed that for the majority of the speculators studied, the primary motivation for continuous trading is the recreational utility derived largely from having a market position.[19] Aside from those who receive some masochistic pleasure

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[19] W. B. Canoles, S. R. Thompson, S. H. Irwin, and V. G. France, "An Analysis of the Profiles and Motivations of Habitual Commodity Speculators" (OFOR Paper No. 97-01, May 1997).

from losing, it seems likely that even those motivated in large part by the desire to have something to get up for in the morning find the pleasure of speculating more satisfying when they win than when they lose.

SPECULATE IN WHAT?

The desire to speculate has always been so strong and widespread that hundreds of examples could be mentioned. Historically, there are some that are difficult even to comprehend today. One of the more fantastic is the trading that took place in tulip bulbs in Holland from 1634 to 1637. The high regard for the tulip held by society leaders spread throughout the country and reached the point at which everybody seemed willing to part with almost anything for rare tulip bulbs. Trading became frantic, and prices rose until entire fortunes were paid for bulbs. When the mania had run its course, the economy of Holland was shattered, and it was years before it recovered.

Similar effects were felt in the eighteenth century from the Mississippi land schemes of John Law in France and the South Sea Bubble that was perpetrated on the English public. The latter created a mood that fostered a rash of some of the most fantastic schemes in the history of finance and caused the ruin of thousands of people. There was the huge subscription for a company that was to manufacture a perpetual-motion wheel. A company was formed to repair and rebuild parsonage and vicarage houses, and among others were companies to supply London with sea coal, rebuild every house in England, settle the island of Blanco and Sal Tarthgus, repave the streets of London, insure horses, and transmute quicksilver into a malleable fine metal. The most preposterous of all was "A company for carrying on an undertaking of great advantage, but nobody to know what it is." Subscribers were to buy 5000 shares at 100 pounds each, with a 2-pound deposit. An annual return of 100 pounds for each share was promised, details to be announced in a month. The issue was oversubscribed in 5 hours, and the promoter left for the Continent that same night and was never heard from again.[20]

In the United States the Florida land boom of the 1920s was comparable to its predecessor bubbles. The results of the worldwide 1929 stock break are well known.

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[20] Charles Mackay, *Extraordinary Popular Delusions and the Madness of Crowds* (London, 1841). Reprinted in 1932 by L. C. Page & Co., Boston, p. 55.

Some areas of speculation have been popular for many years. These include land; precious stones and metals; natural resources such as oil; rare items such as stamps, coins, and paintings; and securities, such as stocks, bonds, warrants, and options to buy or sell stocks.

The type and degree of skill needed for success may vary among these areas, as will the amount of capital required and the mechanics of buying and selling the items. In each case, however, the attraction is the potential profit, the stimulation received from the activity, or their combination. Certain of these items have characteristics that attract some speculators and repel others. The general characteristics of the futures markets are, in some respects, unique.

FUTURES VERSUS SECURITIES AND OTHER SPECULATIONS

One reason for the popularity of futures trading is undoubtedly the ease with which it may be done. Most brokerage houses deal in futures as well as in securities. Some have research departments of their own, and others subscribe to various services, but in either case the speculator looking for a suggested position will have little difficulty in finding one. Some individual registered representatives choose not to handle futures trades, preferring to specialize in securities or mutual funds, but in such cases other registered representatives in the same office are likely to be available. Few are really expert in futures trading, nor do they claim to be, but most are at least able to enter or close out positions efficiently and to pass pertinent information on to the trader if he or she wants it. In addition to full-line wire houses, there are firms that specialize in the handling of futures business. They usually have a considerable amount of factual information available and are especially adept at the order and clerical end of the business, but there is no reason to believe that their market opinions are any better or worse than anyone else's.

Futures speculators who prefer to make their own decisions may be attracted by the relative ease of securing information. Important political and economic information is readily available in general and trade newspapers. Vital supply and demand information concerning specific futures is published in large quantities by various government departments and bureaus and is made available at frequent intervals. In addition to being mailed at low or no cost to anybody who requests it, such information is readily available on the Internet (many web sites of interest to futures traders can be found in Chapter 17). An adequate amount of accurate information about the handful of futures that are traded actively is considerably easier to obtain than about the tens of thousands of stocks, bonds, and mutual funds that are available. The problem faced by those who gather basic information about stocks is quite similar to the problem faced by those who gather basic information about futures. To date no model clearly superior to a random walk has been published to describe the behavior of stock and futures prices. Stock traders, however, may be able to take advantage of some slight trend tendencies and long-run cycles, and futures traders may be able to isolate some conditioned seasonals. Traders in stocks and futures are both faced with the results of information that becomes available while markets are closed, which means that markets are as "active" then as they are when they are open. In both securities and futures there are significant covariances among the prices of stocks representing related industries and among interrelated commodities such as feeds or edible oils.[21]

A basic difference between commodity and stock markets is that futures markets are primary and stock markets are secondary. The futures speculator in the long run must be concerned primarily with the real forces of supply and demand. Speculators in stocks must know about both the markets of the companies in whose stocks they are speculating and the market for the stocks themselves, in which case they must be concerned with the influence of floor specialists, whose influence on prices is somewhat controversial but exists to some significant degree with little doubt.

Like stock traders, futures traders have an advantage in liquidity over speculators in most other areas. There is seldom any difficulty in finding a buyer or seller at any time for even large positions, although, of course, the price may not be so favorable as desired. Positions can normally be acquired or disposed of within a minute or two when the exchanges are open, but if markets are active, an actual report of the transaction might not be received that promptly. There is no need to search out a buyer or seller or wait for an auction, as there would be in trading in paintings, and there are no loans to arrange or escrows to close, as in trading property. Futures traders also can sell short futures easily. This is in marked contrast to the stock market, where the difficulties involved in short-selling individual equities include paying both dividends (to the shareholders from whom

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[21] Labys and Granger, op. cit., pp. 268–270.

the shares were borrowed) and interest (short sellers are responsible for paying interest to their brokerage firms on all credit balances).

Futures traders, unlike stock traders, must consider the limits that restrict the amount by which a futures price can rise or fall in one day and the range over which a future may be traded. These "limit moves" probably concern unsophisticated traders more than they should. For one thing, typical traders will seldom encounter them in a future in which they actually have positions. In addition, of course, they hardly find objectionable limit moves in a direction favorable to them. Their freedom of action is also not restricted by adverse limit moves that do not carry beyond the levels of risk they are prepared to assume. Furthermore, many futures markets do not provide for limit moves, and others do not restrict limits during delivery months.

Some traders are concerned that an adverse limit move will prevent a position from being liquidated with a reasonable loss. The loss, of course, was caused by the adverse price direction and not by the limit move. It should be made clear that a limit move does not cause a market to close; it merely precludes trades from being made beyond the limit. On reaching the maximum possible advance or decline a market may trade any number of times at that level or away from the limit. The purpose of limiting a move is to prevent unreasonable price moves based on overreaction to news. Securities markets deal with similar situations either by suspending trading until a fair and orderly market is again possible or by allowing prices to move over a large and (it may be noted) unlimited range. For a trader liquidity under the first condition is no better than in the futures markets when a market has advanced its permissible limit.[22] In a word, limit moves delay liquidation but neither preclude liquidation nor cause adversity.

Futures margins differ from stock margins in both concept and method of computation. Stock margins constitute a partial payment to the brokerage house. The remainder, or debit balance, in a margin account is a debt owed to the brokerage house on which interest is charged. The amount of the debt may be limited by the Federal Reserve, a stock exchange, or the brokerage house itself. Futures margins are actually good-faith deposits to protect a broker against risk in the event of adverse price moves in the interim between the establishment of a position and its liquidation either by delivery or by offset. Payment for the cash commod-

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22. C. V. Harlow and R. J. Teweles, "Commodities and Securities Compared," *Financial Analysts Journal* (September–October 1972), 65–66.

ity needs to be made only in the highly unlikely event that delivery is actually made or taken.

Stock margins required typically fluctuate in a range of 50 to 90 percent, although both limits of this range have been exceeded for brief periods. Futures margins are based on fixed minimums per unit such as ounces, pounds, tons, or face values of financial instruments established by the exchanges, but individual brokers may require larger amounts if they believe the minimum involves undue risks for themselves or their clients. Requirements within a range of 5 to 10 percent of contract value are common, although the amount may be less than 5 percent in low-risk spread positions. The margin on 5000 bushels of corn, for example, might typically be about 15 to 22 cents a bushel with corn selling at $3 to $4. On a contract value in the area of $17,500 the deposit required might be only $750 to $1100. If 5000 bushels of May corn were bought against the sale of 5000 bushels of July corn, the total margin for the entire position might be as low as $250, and even this amount would probably be required by the broker rather than by the exchange. When markets become unusually volatile, margins may be raised to protect the brokerage house from its clients and, perhaps, the clients from themselves. Even at such times margins exceeding 20 percent of contract value are unusual. Brokerage houses may offer varying margin levels to different clients provided that they equal or exceed levels established by the exchanges. The Commodity Exchange Act (CEA) provides for allowing the granting of special low margins to bona fide hedgers.[23]

The low margins not only provide the opportunity to establish large positions on a small capital base but also give the futures markets their somewhat undeserved reputation for extreme price volatility. Futures prices frequently remain in quite narrow ranges for long periods and are not more volatile than typical securities prices in similar price ranges. The price movements of futures, however, relative to the margin required can create large profits or losses relative to the available trading capital. Traders who find changes in values too great for their capital or nerve can reduce the leverage employed merely by utilizing more margin than is required and thereby trade on a more conservative basis. Too many traders take advantage of the possible rewards without accepting or recognizing the accompanying risks by fully utilizing the available leverage. This is why it is often maintained that bulls or bears can trade profitably, but not hogs.

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[23] General Regulations under the Commodity Exchange Act, Reg. 1.3(z)(1).

The cost of trading futures is low in relation to trading in other areas. Commissions paid are usually less, considering the value of the merchandise traded, than those in land, precious goods, paintings, prints, or securities. Computation is simpler because commissions are based on the number of contracts bought or sold and are unrelated to the amount of money involved in a transaction, as they are in the security markets. For example, regardless of the price of 100 ounces of gold, which is equivalent to a stock round lot, the commission varies among brokers but is about $10 to $20, which covers both the purchase and the sale.

The amount of record keeping required by a futures trader is minimal unless the position held is so large that it must be reported to the Commodity Futures Trading Commission. Reportable and maximum limits are so great that they are only of academic interest to most traders.

Tax rules covering profits and losses on futures positions are different from those covering securities despite the fact that both are capital items. Generally, gains in futures are deemed to be 60 percent long-term capital gains and 40 percent short-term capital gains regardless of how long positions have been held. They are also deemed to be taxable at year-end whether the positions are actually liquidated or not. Tax laws are subject to change, and there are various exceptions to these generalities, so traders are well advised to acquire the tax information applicable to them from their tax advisers or brokers.

The futures markets operate under rules and regulations of the exchanges and those of the Commodity Futures Exchange Commission. There are also various state laws affecting areas of trading not governed by federal law. There is also a trade association, the National Futures Association (NFA), which operates in a manner comparable to that of the National Association of Securities Dealers (NASD) for securities.

There are those who are fond of pointing out that futures traders who are long on the contracts of most futures in the spot months risk getting unwanted deliveries. They usually refer to someone, invariably unnamed, who forgot about a wheat contract and came home to find wheat piled on the front lawn. In reality, futures traders have less to worry about concerning deliveries than securities traders. If they are short, they cannot get delivery at all. If they are long, they can avoid delivery merely by selling the position before the contract month arrives. If a position is carried into the delivery month, there is still no certainty that delivery will be received, but even if this occurs, the position can usually be disposed of before the close of the day's trading session. Even if this is not possible, the cost of carrying a delivered position for short periods is small, and the position can usually be sold when desired. Securities traders may well have far greater delivery problems if securities are misplaced. There is considerable time and trouble involved in disposing of securities if they are misplaced, as well as the expense of paying for a bond to protect the broker if they are found and sold by someone else. The cost may be particularly high in the case of bearer bonds.

Trading in futures is more like trading in securities than other types of speculation, but it should be noted that where there are differences between the two fields, futures trading is almost always the simpler. This, of course, does not imply that successful results in futures trading are more certain. The fact remains, however, that futures traders are not concerned with dividends, interest, rents, royalties, stock dividends or splits, rights offerings, handling certificates, proxies, ex-dividend dates, voting, call dates, conversions, or any other of the host of factors that might burden securities traders. Futures traders incur lower costs of trading relative to the amount of money traded because commissions are relatively lower than on most securities. Because the money they deposit as margin is a good-faith deposit and not a down payment, they owe their broker no money and hence pay no interest. Their costs of trading, of course, could become quite high if trading is frequent.

SHOULD YOU SPECULATE?

It is hardly proper for the authors of a book, brokers, or financial advisers to advise individuals to speculate or not to speculate. Some speculators make important amounts of money by speculating. They would not have been served well by someone who persuaded them not to risk losing any money and thus prevented their success. Similarly, it seems improper to suggest that everybody should speculate when it is known that most speculators are unsuccessful and therefore that the odds favor any particular new speculator losing. The decision to be conservative or aggressive with one's funds is best made by the one who is going to try to acquire more at the risk of losing whatever is already had. The logical basis for making the decision can be discussed productively, however.

The most common advice given to would-be speculators by many advisers is that they should speculate only when all of their financial responsibilities have been met, that is, when their insurance programs are adequate, when they have adequate equities in their homes, when their children's educations are complete or provided for, and when some money is available for emergencies. This approach is certainly cautious enough, but it might make some wonder what the purpose of speculating is. The reason most people want to increase their net worths is to raise their standards of living. If they have funds available to accomplish everything they regard as important, successful speculation can do little to improve their situations significantly, whereas unsuccessful speculation could leave them in positions that are far worse than those from which they began. In short, they have much to lose and little to gain.

In contrast, one with relatively little capital might appear to be irresponsible if a speculative venture is entered, but if a loss would not create despondency, an aggressive program might not be altogether unreasonable. Success might improve the financial condition of such a person to an impressive extent, whereas a loss could usually not cause great damage.

Regardless of the amount of capital available to traders for speculative purposes, their own natures are probably even more important than their available capital. There are those who are simply unable to take a loss or allow enough time for a profitable position to grow to its full potential. Some people are able to make a logical plan and follow it with a high degree of discipline. Others prefer to take things as they come rather than follow a rigid program. There are certainly activities to which the latter are well adapted, but speculation is not one of them.

There are those who find that the tension of carrying a position is so great that it interferes with their work or other activities to a degree that makes any profit they might gain not worth the anguish of realizing it. It is well and good to suggest "selling down to a sleeping point," but there are those who are so emotional that they cannot sleep if they have any position at all because they are so concerned about where the market will open in the morning. If it is necessary to trade on such a small scale that the chance for important gains is lost, it hardly seems reasonable to expend the energy needed to trade at all.

All potential speculators must consider their own capital positions along with their responsibilities and decide whether to risk some of what they have in an effort to gain more. They must also take adequate stock of themselves to determine whether the costs in time, energy, and stress involved in trading are worth expending for any profits that may be achieved. Speculating in futures may be an expensive mistake for some, but not speculating might prove equally or even more expensive for others in terms of opportunities lost. It is not the function of this book to convince readers that they should or should not speculate in futures. The purpose is rather to provide information about the nature and behavior of futures markets, information about the procedures used by successful traders and the pitfalls they face, fundamental and technical considerations, and information about specific markets to help readers make intelligent decisions for themselves.

2 CHAPTER

The Nature of the Futures Markets

"Personally I am always ready to learn, although I do not always like being taught."

—Winston Churchill

INTRODUCTION

Trading futures is a skill, and no skill develops powerfully when one is wearing blinders. For that reason prospective traders must understand the nature of the environment in which they are to pit their skills against others who play the same game.

This chapter, then, discusses the nature of the contract the participants hold while playing the game, the nature of the organized markets for those contracts, the nature of the open interest (i.e., the kinds of participants in the game), and the nature of cash and futures price relationships. The last includes a detailed analysis of the structure of the hedging process. Finally, a discussion of market performance contains an analysis of the many connections between futures markets and price variability.

NATURE OF THE CONTRACT[1]

Regardless of whether the user of the traditional futures contract is a hedger or speculator, the common bond is the nature of the contract itself. That contract is a firm legal agreement between a buyer (or seller) and an established futures exchange or its clearinghouse in which the trader agrees to deliver or accept during a designated period a specified amount of a certain product that adheres to the particular quality and delivery conditions prescribed by the exchange on which that future is traded or make a cash settlement. The contract, if allowed to run to its termination, is fulfilled by a cash payment on the delivery date based on the settlement price for that day in some cases, and in the case of most tangibles, actual delivery of the commodity occurs.

During the time that the contract is open, the trader must agree to a series of conditions with a qualified broker (or the clearinghouse if the trader is a member) which calls for an initial margin deposit, a prescribed margin level that protects the broker from possible losses resulting from adverse price movements, and the right to close out (offset) an open contract at any time simply by properly instructing the broker to do so. The last condition is a bilateral one that permits the broker to close out the trader's position if the margin is seriously impaired.

This basic commitment has several ramifications. Although the contract defines the quantity, the quality, and the location at which the future may be delivered, there are, as a rule, alternatives available to the seller that allow for delivery of a commodity to be made with substantial deviations from the par specifications. The seller faces a scale of premiums or discounts in price because of such deviations, which might include different delivery locations or variations in the weight or grade of the commodity to be delivered. Deliveries must be made during the delivery month traded, but the actual day of the month is selected by the seller, who usually issues a notice of intention to deliver in the form of a warehouse receipt, a shipping certificate, or a bill of lading.

The trader holding a contract will usually be dealing through a futures commission merchant (broker) who is a member of an exchange and who will charge a commission for his or her services. It is the member

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[1] The following discussion draws on Henry B. Arthur, "The Nature of Commodity Futures as an Economic and Business Instrument," *Food Research Institute Studies in Agricultural Economics, Trade, and Development,* **11,** No. 3, 257–260.

broker who is responsible for the fulfillment of the contract if that broker is a clearing member of the exchange. If the broker is not a clearing member, the trades must in turn be cleared by a clearing member.

The contracts themselves are subject to legal provisions as well as the rules of the various exchanges, such as the setting of trading hours and trading regulations including minimum margins and the daily limits beyond which the prices of particular futures cannot move. These and other specifications of most futures contracts traded on all major exchanges are reviewed in Chapter 3.

There are, then, two major elements of the commitment assumed when a trader enters into a futures contract. The first is a promise of actual delivery of a future or a cash settlement at a designated date in a way that conforms to exchange specifications unless the contract has been previously offset. The second is a promise to respond promptly to adverse daily price changes by payment of cash to a member broker, who must in turn respond to a call for the cash from the exchanges' clearinghouses, the operation of which is discussed in the following section. The daily settlement process maintains the viability of the first promise to deliver or make a cash settlement. Traders who wish to cancel their commitments to make or accept delivery of actual commodities merely need to enter the market and offset their open positions. Over 98 percent of all futures contracts which provide for delivery are settled by offset rather than by deliveries.

Until actual delivery a transaction in a futures contract does not involve anything beyond the daily process of generating profits or losses against a good-faith margin deposit with a broker. There is no debit balance; hence no interest is charged. All net balances are on the credit side and are marked to the market after each day's trading. The actual buy and sell occur only after an intent to deliver is indicated by a short, at which point a specific buyer and seller are paired at the current settlement price.

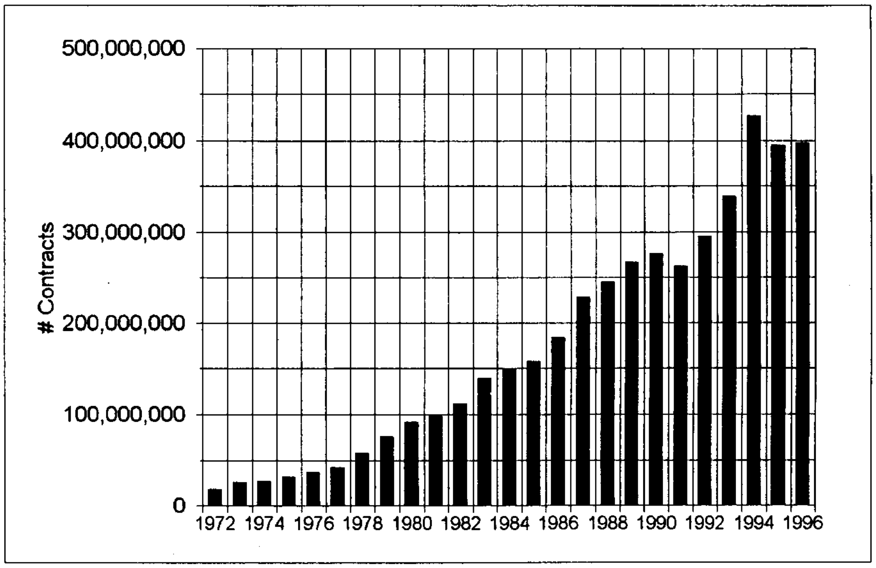
NATURE OF EXCHANGE OPERATIONS

The need for holding futures contracts has grown at a rapid pace in recent years. To facilitate this growth about 80 futures contracts are traded actively on 11 exchanges in the United States and a much larger number in the rest of the world. Figure 2-1 illustrates the growth cycle of futures contracts trading on American exchanges.

The dollar value of the contracts traded on the futures exchanges annually in the United States is measured in trillions of dollars. This dol-

FIGURE 2–1

Futures volume, U.S. exchanges, 1972–1996.



Source: Futures Industry Association.

lar value varies widely because of the variation in the number of active futures contracts, volume, and price levels. It is certainly clear, however, that the volume of futures trading dominates that of physical cash trading in commodities which underlie the futures. The small number of actual deliveries against futures contracts further indicates the dominance of futures over physical trading. It is not unusual for futures trading to represent 20 times the size of the actual crop to be traded before the expiration of the crop year, and sometimes the figure is far higher. The size and value of each contract vary widely according to each commodity, as summarized in the contract facts discussion in Chapter 3.

Commodity exchanges may perform many functions, such as supplying accommodations for trading, handling, and grading cash commodities, but basically they exist to provide their members with facilities for trading items for future delivery. It is important to note that the exchanges themselves do not trade contracts, nor do they set the prices at which contracts are traded. They merely furnish a place where people in the commodity business, speculators, or their representatives can meet to buy and sell futures contracts and also establish rules and procedures designed to make such trading fair and orderly.

Most exchanges are voluntary associations of members whose primary business is producing, marketing, or dealing in the items underlying the contracts traded on the exchanges. The number of memberships ranges from about 200 on the Kansas City Board of Trade to over 1400 on the Chicago Board of Trade and over 1800 on the New York Futures Exchange. Memberships are usually acquired from other members, subject to the approval of the exchange. In some cases an exchange may wish to expand membership, and so it sells memberships itself. In other cases an exchange may wish to reduce membership, and so it retires memberships as they become vacant.

Each exchange differs in some respects from the others, but the similarities are many. All futures orders received by member firms are transmitted to the exchange floor by telephone or private wire for execution and are filled according to bids and offers in the respective trading areas by open outcry to all members present at the time. Typically, one commodity is traded in a pit or around a ring unless the volume is too small to justify so much space. Customarily, those trading the same delivery month of a future gather in the same area of the ring or pit so that brokers can fill their orders as rapidly and efficiently as possible.

Whenever volume is high and price changes are rapid, it is not uncommon for different prices to be bid and offered for the same delivery in different parts of the trading area at the same time. The trader must remember that these conditions might result in executions at prices that are never officially quoted, or, even more difficult to understand, these conditions might cause the return of an order marked "unable," even though the price on the order was well within the range of trading in that future.

Immediately after each transaction on an exchange a recorder, who is an employee of the exchange, writes out a record of the transaction, including its price and the time at which it was made, and then enters details into the exchange's reporting system by means of a computer terminal. The information is displayed on the trading floor and is also transmitted for display on tickers or quotation screens via electronic means to brokers and others who subscribe to the exchange's market data services. Futures exchanges typically report the future traded, the month, the price, and the time of sale but, unlike stock exchanges, omit the volume.

Some markets start each day's trading with an open auction in all contract months and continue to trade in that manner all day. Under this system all months in a particular future begin to be traded at the opening bell. Others open and close on a call basis, which means that each contract is called in turn until all orders currently on hand for that contract, except limit and stop orders away from the market, are filled.[2] After all contracts are opened, the market continues on an open auction or on the blackboard until halted by the closing call.

All this makes little difference to individual traders except that they must remember that spread orders in call markets (e.g., silver) cannot be filled on the opening or closing because only one future month at a time is being traded. The client may enter a spread order limited to a given difference in price which was noted on the tape or a broker's quote machine early or late in the day. When the broker tells the client that the order could not be filled, the customer sometimes assumes unfairly that the market was missed, not realizing that the order could not possibly have been filled.

At the end of each day the clearing organization which is related to the exchange assumes one side of all open contracts. If a broker is long, the clearing organization has the other, or short, position; if a broker is short, the clearing organization assumes the other, or long, side. The clearing organization guarantees its members the performance of both sides of all open contracts. Each broker, therefore, who is long or short on a futures contract deals only with the clearinghouse after a position has been initiated and not with the broker who actually took the other side of the trade when it was made. In effect, all obligations to receive or deliver commodities are with the clearing organization and not with other brokers or individual traders.

The clearing organization does not care about the prices at which each trade was entered because all profits and losses are settled daily in cash according to the latest settlement price. Because the clearing organization always has a zero net position, it can operate easily without any reference to entry or exit prices for the individual trades on its books. Only the customer and broker are interested in these matters.

The total of the long or short positions held by all the clearing brokers which are outstanding at a given moment (and which are always equal) is called the "open interest." A broker who is long on a futures contract can meet this obligation either by accepting delivery during the delivery month or by selling the position to someone else who chooses to buy it. If the position is sold to someone who has chosen to be long, the open

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[2] These and other orders are discussed in detail in Chapter 3.

interest is unchanged. If the position is sold to a short who is buying in a position, the open interest is accordingly reduced. A broker who is short on a futures contract can meet this obligation by making delivery or by buying in the position either from someone else who wishes to be short or from someone on the long side who is selling out a position. The total size of the open interest and volume indicates the degree of current liquidity in a given market and is tabulated daily for each delivery month of every future by the clearing organizations of the exchanges. The Commodity Futures Trading Commission (CFTC) also publishes monthly and annual figures. The attempt by technicians to relate changes in open interest to simultaneous, preceding, or lagging changes in volume and price is discussed in Chapter 7.

Futures may be traded for delivery during any future month listed, but only a few months of the year ordinarily become active, usually in accordance with trade needs or customs, such as the normal harvest time of a crop. All months in which most futures are traded are listed with other pertinent contract facts in Chapter 3.

Some exchanges, such as the Chicago Board of Trade, the Chicago Mercantile Exchange, and the MidAmerica Commodity Exchange, each handle long lists of futures numbering about 20, whereas others, such as the Minneapolis Grain Exchange and the Chicago Rice and Cotton Exchange, might handle only one or two. Sometimes the same future is traded on more than one exchange. This is usually a matter of regional requirements, as in the case of wheat, in response to which Soft Red is traded in Chicago, Hard winter in Kansas City, and Northern spring in Minneapolis. Sometimes more than one type of a commodity can be delivered against an exchange contract; for example, Soft Red, Hard Red winter, Dark Northern spring, and Northern spring are all deliverable against the Soft Red contract on the Chicago Board of Trade.

NATURE OF THE OPEN INTEREST

Although exchanges differ in futures traded, location, size, and details of their operations, the people who trade on them are all similarly motivated. Basically, there are floor traders of various types, outside speculators, and hedgers. Speculators and hedgers, unlike floor traders, may or may not be members of the exchanges on which they trade, but whether they are or not primarily affects their commission and margin requirements and not the manner in which they trade or their reasons for trading. Because the remainder of the book centers on the activities and techniques of the market participants, they can be introduced briefly at this point.

Speculators

Speculators are interested in profiting from a price change in a futures contract. They are not interested in taking delivery or making delivery of the future in which they trade, although they may do so sometimes in connection with their speculating. Speculators may trade from the floor of an exchange if they are members or through a broker if they are not. They differ from one another in several ways. Some trade small positions and some quite large positions, even up to the limits imposed on speculative positions by the CFTC or by the exchanges, as illustrated in Chapter 3. Some prefer to trade from the long side, some from the short side, and some prefer to trade spreads rather than net positions. Spreading, like security arbitrage, is usually done by the more sophisticated traders.

One of the great differences among speculators is the length of time during which they are prepared to hold a position. A small number prefer to wait for a full move, which could take months, a year, or even more to develop, and will hold a position for as long as necessary. Position traders of this kind formerly had the additional incentive of being able to take advantage of the favorable long-term gains provisions of the Internal Revenue Code when trades were successful, but this incentive no longer exists. Most traders hold their positions for much shorter periods, and there are some who, whenever possible, get out the day they get in. These day traders are sometimes called "scalpers." Although they are seldom able to realize large gains in so short a time, neither do they sustain large losses on trades which are liquidated in one day. In addition, day traders receive more favorable margin requirements and, on many exchanges, benefit from a materially reduced commission rate. Unfortunately, many unsophisticated day traders develop a practice of liquidating only their day trades that go in the right direction and maintaining positions that go wrong, with the inevitable eventual record of an accumulation of many small profits which are more than countered by some large losses. Although commissions on individual trades may be small, the frequent trader, of course, is quite able to accumulate enough total commissions to overcome any gross profit which might somehow have been generated. The number of successful nonmember day traders in relation to the number who try day trading is quite small in the long run.

The most substantial change in the speculative makeup of the derivatives markets is the proliferation of the managed futures industry. This group of speculators manages assets for institutions and individuals and has grown from about $500 million in 1983 to nearly $30 billion in 1997. The assets are managed by professional commodity trading advisors (CTAs), who specialize in trading various futures markets using a variety of analysis techniques. A substantial number of small speculators have abandoned their trading efforts in lieu of such funds, in the same manner as investors have reduced their exposure to individual stocks in favor of mutual funds. CTAs represent about 10 percent of total trading volume on U.S. exchanges.

Floor Traders

Floor traders are members of the exchange who make their transactions in the pit or around the ring on the exchange floor itself, as contrasted with other members who choose to trade off the floor through member brokerage houses. Floor traders, like nonmember speculators, can trade for their own accounts. They can establish long-term positions or day-trade. Others act as scalpers, trading many times each day. Some try to buy at the current bid prices or sell at the current offer prices, knowing that they can reverse any positions thus established with little or no adversity. This practice is sometimes called "trading at the edge." Still others specialize in spreads by taking opposite positions between contracts when the price difference appears abnormal. Floor traders may work in one future or in several. They have such advantages as being able to trade with minimum commissions or margins. Trades liquidated in the course of a day seldom require margin deposits, and trades liquidated at the same price at which they were established ("scratches") incur little or no commission expense. In addition, floor traders are able to take or liquidate positions quickly, but this in itself does not assure profits. A bad position taken quickly is bad nonetheless. A bad position liquidated quickly might have lost less if liquidated slowly. Floor traders trading for their own accounts are sometimes referred to as "locals." Some become quite prosperous; many others do not, despite the market information disseminated by some brokers indicating what the locals are doing, which sometimes leaves the impression that locals almost never lose.

Some members act as floor brokers, handling orders for others but seldom or never trading for themselves. These brokers specialize in orders emanating from futures commission merchants or from customers in the trade, such as processors, exporters, and warehousers. They receive only a small part of the commissions paid by customers to their commission houses, but brokers who handle the orders for large commission houses may gather in substantial volumes of business, and their total incomes can be quite impressive. The orders held by floor brokers at any given time are referred to as their "decks." They may trade for their own accounts if they wish, but they must not trade in such a way that anything they do is in conflict with their decks. As in any other fiduciary relationship, the customers' interests are to be placed first.

Hedgers

Futures trading grew out of the needs of the manufacturers, merchants, and dealers engaged in the business of producing, merchandising, and processing commodities. Some of the earliest markets featured the grains, and most of them are important today. Their salient point was that they existed primarily for delivery and therefore were characterized by rules governing merchandising transactions, standards ensuring grade and delivery terms, and clearing arrangements. Futures contracts soon came to be viewed as temporary substitutes for cash contracts, and traders found it rewarding to be able to establish prices for a future date.

The most important role played by early futures markets was in the hedging of inventories. During the peak marketing season tradespeople often bought more than enough to fill their current orders to be sure of being able to meet the demands of their customers until new supplies became available. The merchants and dealers of those grains incurred the risk of unfavorable price changes that could easily outweigh the other risks, such as fire, theft, or windstorm, they faced as a matter of course. Grain prices, then as now, were notoriously volatile because they were not only subject to the vagaries of supply and demand but also affected to an unusual degree by weather, unexpected political developments, and sometimes illogical changes in public psychology. Merchants and dealers with heavy inventories of an unsold crop could face disastrous losses in the event of a material drop in prices. Those same participants who made forward sales based on current cash prices and who relied on purchasing inventories later to meet their commitments rather than pay storage charges for the cash grain would have a similar problem if prices rose sharply.

The hedging function, then, naturally focused on the role of transferring the risk of drastic inventory price changes to other holders in the futures markets. The other side of the transaction necessary to accomplish this might well have been taken by another hedger who was offsetting an opposite risk or was liquidating another hedge as a result of a change in his position in the cash market. More often than not it was taken by a speculator attempting to make a profit. It appears, on the surface, that this risk of price change would not be important in the long run because of the windfall profits that would compensate for disastrous losses. Most businesspeople learned in those early years, however, that they would gladly forgo large profits to avoid large losses because of the danger that they might not survive the large loss to enjoy the large profit if the loss came first. There was also the danger that a number of losses might precede a number of profits.

The traditional risk transferal concept of hedging has evolved into a dynamic concept of risk management which accents the maximization of expected return as well as the position of merely minimizing risk. In this regard hedging is now viewed by many sophisticated users as an important management tool which can facilitate buying and selling decisions and give greater freedom for business action not only in markets dominated by the necessity of carrying inventories from one period of time to another but also in nonstorage markets. The evolution of the hedging process and an analysis of the motivation and mechanics of hedging are covered in a subsequent section.

NATURE OF CASH AND FUTURES PRICE RELATIONS

Introduction

There is a basic truth about futures contracts. Most are temporary substitutes for cash items. The realization that delivery of real goods is often guaranteed if the contracts are held to maturity impresses upon speculators, both small and large, that speculation in futures is not just a numbers game which is conducted in Wonderland. Because of this, the trader should understand the relation between cash and futures prices. Perhaps this clarification can be made by indicating the complexities of the role of hedging in the futures markets.

There can be no serious exceptions to the statement that futures trading depends on hedging. Markets simply do not come into existence solely to furnish a speculative arena, nor do they persist if hedgers, the inhabitants of the land, do not find it rewarding to continue to use those markets. The higher the level of hedging, the higher the level of futures business.

The relation between hedging and speculation is discussed in the final section of this chapter.

The trader should be apprised that the literature on hedging in futures markets is not the essence of clarity. It is often disjointed, and the thoughtful work is not generally available to the casual trader. In an attempt to define and develop the controversies as they have appeared, four classes of hedging theory are discussed,[3] each of which differs in the assumptions made about the attitudes of hedgers toward risk and motivation for using the futures markets.

Hedging Carried Out to Eliminate the Risks Associated with Price Fluctuations

The risk-elimination view of hedging usually begins with a naive illustration of the two kinds of hedges. A processor holds 100,000 bushels of cash wheat at $3.50 a bushel and is fearful of a decline in price. The processor immediately sells 100,000 bushels of futures contracts at $3.50 and is thereby short hedged. If the feared decline materializes and wheat drops to $3.35 a bushel, the profit on the short sale of futures exactly offsets the loss on the inventory. A long hedge is illustrated in much the same manner. A commercial business with a commitment to sell 100,000 bushels of wheat at a specific price and time in the future, which it has neither bought nor contracted to buy, can protect itself by buying a futures position equal in amount to its forward sale and thereby fix its forward costs. Thus the hedging process is said to eliminate the risk of price fluctuation.

In real life hedging decisions are neither really so simple nor mechanical. The grade of the commodity owned or sold forward by the prospective hedger may not be the same as the contract grade traded on the futures exchange. There might also be variations in the discounts or premiums of "off" and "on" grades which have been hedged in relation to the basic contract grade. Trade houses serving or buying from local areas might be confronted with conditions somewhat different from those affecting markets elsewhere. Sales and purchases of the cash commodities do not always correspond exactly with futures market contract units. Merchants and dealers might prefer to sell in amounts geared to contract units,

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[3] This approach was employed by Roger W. Gray and David J. S. Rutledge, "The Economics of Commodity Futures Markets: A Survey," *Review of Marketing and Agricultural Economics,* 39, No. 4, reported by the Food Research Institute, Stanford University, Stanford, Calif., 1972.

but there is inevitably some variation. If elimination of risk is to be a reality, buyers in the field must report their purchases to be hedged before the market closes. Cash business can still be conducted after the futures close or before they open, which means that either some hedging must be delayed until the following day or, as noted later, some must be done in *anticipation* of further cash business.

Because of the "equal but opposite" connotation implied in the naive view of hedging, the concepts of hedging and insurance seem to be analogous. In fact, apart from the problems just discussed, the hedger is insured against price risk only if cash and futures prices move in parallel. The literature is replete with examples that indicate that cash and futures prices do *not* move in parallel.[4] The naive view of risk elimination must, then, give way to a risk-reduction concept.

Hedging Carried Out to Reduce the Risks Associated with Price Fluctuations

Even though it has often been found that cash and futures prices do not parallel one another, researchers have been able to muster considerable support for the proposition that a change in cash prices frequently results in a *similar* change in futures prices, particularly if some unexpected event causes a violent price change. Cash and futures prices, it has been ascertained, will not always move exactly together, but a material movement by them in opposite directions is quite unusual.

The arithmetical difference between the cash and futures prices at any time is known as "*the* basis." The usual difference reflects a premium or discount of the cash price versus the nearby future; for example, No. 1 soybeans in June might be quoted at 15 cents over the August future, in which case the basis would be expressed as "15 over." On the other hand, the individual hedger, concerned primarily with his or her own position, would be inclined to speak of "my basis." "*My* basis" refers to the difference between the price of "my" commitment in the actual product expressed as a premium or discount and the price of the specific future contract in which the individual hedger has affected a short hedge. "My basis" remains unchanged as long as the established price relationships remain in effect. The size of the premium or discount provides a bench-

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[4] Readily available source materials for the trader are the booklets on hedging published by many brokerage houses and exchanges.

mark against which the closeout prices of both positions may be measured. If the spread between "my" cash commitment and the nearby future contract remains unchanged or moves to a more favorable closeout basis, "my" transactions will have been successful.[5]

Nothing, of course, precludes the basis from being quoted in distant options. Besides the current cash price being above or below that of futures options, nearby futures market prices may be above or below those more distant prices that reflect the same crop. In seasons in which supplies are normal or large the later contracts generally show a premium. Such a market is referred to as a "carrying-charge market." When supplies are tight, nearby contracts may reflect the scarcity of the cash market by selling at premiums over more distant contracts, in which case the market is said to be "inverted." Whether the current cash market is above or below prices in the futures market and whether the futures market is at carrying charges or inverted, and by how much, is vital to hedgers making price decisions. The same conditions can also influence speculators, who might attempt to make their decisions partly by considering what hedgers are likely to do.

If the risk-reduction premise is accepted as the major reason for indulging in the hedging process, the usefulness of any market must depend on how closely cash and futures prices move together. The methodology employed in such a search is predictable. First changes in cash prices and then changes in the basis must be measured. If the variation in cash prices is larger than the variation in the basis, the futures market can be considered an effective tool for reducing the risks associated with price fluctuations. Studies employing this kind of analysis have confirmed that there is considerably less variation in the difference between cash and futures prices than there is in cash or futures prices alone.[6] That there is a significant positive correlation between cash and futures prices is now regarded as the first axiom of the hedging process.

At this point the usual definition of the hedger as an aloof onlooker rather than a participant in the speculative market pricing process begins to

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[5] A complete discussion of "basis" is given by Henry B. Arthur, *Commodity Futures as a Business Management Tool* (Cambridge, Mass.: Division of Research, Graduate School of Business Administration, Harvard University, 1971), pp. 64–69.

[6] L. D. Howell authored two such studies for the USDA: *Analysis of Hedging and Other Operations in Grain Futures,* Technical Bulletin No. 971 (August 1948), and *Analysis of Hedging and Other Operations in Wool and Wool Top Futures,* Technical Bulletin No. 1260 (January 1962). He also coauthored, with L. J. Watson, *Relation of Spot Cotton Prices to Futures Contracts and Protection Afforded by Trading in Futures,* USDA Technical Bulletin No. 602 (January 1938).

blur. Indeed, the trader begins to understand that in most circumstances hedging is merely a form of speculation—speculation on the basis. The hedger differs from the speculator only because the variation in his outcome is generally less. What the hedger accomplishes is the specialization of risk, not the elimination of it. The short hedger, for example, passes to the speculator the risks of anticipating changes in absolute prices and retains the "basis risk," that is, predicting the demand for stocks. If he can forecast the volume and timing of demand for his product for a given level or risk, a short hedger might well be able to hold a much larger volume of hedged inventory than he could hold unhedged. Such a thought raises the possibility of hedging for profit as well as reduced risk.

Hedging Carried Out to Profit from Movements in the Basis

If merchants or processors feel that they have a comparative advantage in anticipating the yield on their inventories, the important question is no longer how *closely* cash and futures prices move together (the stability of the basis) but rather whether such movement is *predictable.* Working[7] produced data on wheat prices that indicate that basis fluctuations are predictable. A more recent study has provided supporting evidence for corn and soybeans.[8] Working's conclusions invited a significant expansion in the possible motivations of hedging:

1. It facilitates buying and selling decisions. When hedging is practiced systematically, there is need only to consider whether the price at which a particular purchase or sale can be made is favorable in relation to other current prices; there is no need to consider also whether the absolute level of the price is favorable.
2. It gives *greater freedom for business action.* The freedom most commonly gained is that of buying; for example, when a particular lot of the commodity is available at a relatively low price, regardless of its absolute level (this freedom is related to but distinct from the facilitation of decision mentioned above); often, moreover, the freedom gained is to make a sale or

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[7] Holbrook Working, "Hedging Reconsidered," *Journal of Farm Economics,* 35, No. 4 (November 1953), 544–561.

[8] R. G. Heifner, "The Gains from Basing Grain Storage Decisions on Cash-Future Spreads," *Journal of Farm Economics,* **48,** No. 5 (December 1966), 1490–1495.

purchase that would not otherwise be possible at what is judged a favorable price level, as when a cotton grower sells futures in advance of harvest, or a textile mill buys futures because cotton prices are judged to be favorable, but the desired qualities of cotton cannot be bought immediately in the spot market.

3. It gives a *reliable basis for conducting storage of commodity surpluses.* The warehousing of surplus commodity stocks is a very uncertain and hazardous business when based on trying to judge when the price is favorable for storage; hedging allows operation on the basis simply of judgment that the spot price is low in relation to a futures price.
4. Hedging *reduces business risks.* There is usually reduction of risk when hedging is done for any of the previous three reasons (though often not under the second reason), but any curtailment of risk may be only an incidental advantage gained, not a primary or even a very important incentive to hedging.[9]

The enlarged concept of hedging, which emphasizes the expected returns rather than simply reducing risk, came to be called "arbitrage hedging" and stemmed from the belief that hedgers develop a sophisticated understanding of factors that determine prices in the commodities in which they deal.

Working developed the concepts of "selective" and "anticipatory" hedging to deal with actions based on expectations. Selective hedging is partial hedging which occurs when hedgers have made subjective determinations on a price rise or fall in a coming period. Because of this determination, hedgers may leave some or all of their inventories unhedged. Thus a firm would employ short hedging only when a price decline is expected and would not carry short hedges at all when a price increase is expected. Anticipatory hedging would involve the purchase or sale of futures in anticipation of a formal merchandising commitment to be made later, and the operator would carry an open position in the futures market for a time without an offsetting cash commitment.

An excellent example of arbitrage hedging is reflected by soybean processors' use of the markets for soybeans, soybean meal, and soybean oil. The relation between the soybeans and their products enables processors to set hedging policies, for example, according to expectations of a

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[9] Working, op. cit., 560–561.

large crop, a short crop, processing margins, and the relative demand for meal or oil.

The major considerations of hedgers in making their decisions revolve around their particular bases and the premiums or discounts among forward future contracts. The literature developing these relationships has come to be known as the "supply of storage" theory.[10] The objective of the theory is to explain temporal (over time) differences between cash and forward prices or between cash and expected future cash prices in commodities with continuous inventories. Until recently futures trading was limited to commodities that could be stored for relatively long periods; hence a significant body of knowledge was built up. Price relationships for seasonally produced commodities with discontinuous inventories, such as Maine potatoes, or for continuously produced commodities in which no inventories are held at all, such as live cattle, must emphasize the forward pricing function.

The costs of holding inventory include carrying charges, such as interest and insurance, and the risk of price fluctuation. The benefits of holding inventory have been referred to broadly as the convenience yield, which arises from holding, per se, a certain level of inventory. If a processor, for example, inadvertently runs out of inventory, sales may drop precipitously, and the processor may not cover overhead expenses. Ensuring that inventory does not drop below a given level reduces the chance of incurring such out-of-stock costs. A processor may wish, too, to maintain a relatively stable retail price level for a product, even though raw material prices fluctuate considerably. The processor can accomplish this more efficiently by having a sizable inventory base that will allow a more stable average price. The convenience yield can offset some or all of the carrying costs associated with stocks. As soon as a short hedge, for example, is

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[10] M. J. Brennan, "The Supply of Storage," *American Economic Review,* **47** (March 1958), 50–72; Paul H. Cootner, "Speculation and Hedging," *Proceedings of a Symposium on Price Effects of Speculation in Organized Commodity Markets, Food Research Institute Studies,* Supplement, 7 (1967), 65–105; Nicholas Kaldor, "A Note on the Theory of the Forward Market," *Review of Economic Studies,* **7** (June 1940), 196–201; John Maynard Keynes, *The General Theory of Employment, Interest and Money* (New York: Harcourt, Brace, 1936); Lester G. Telser, "Futures Trading and the Storage of Cotton and Wheat," *Journal of Political Economy,* **66** (June 1958), 233–255; Holbrook Working, "Price Relations between July and September Wheat Futures at Chicago since 1885," *Wheat Studies,* **9** (March 1933), 187–238; Holbrook Working, "Price Relations between May and New Crop Wheat Futures at Chicago since 1885," *Wheat Studies,* **10** (February 1934), 183–228; Holbrook Working, "Theory of the Inverse Carrying Charge in Futures Markets," *Journal of Farm Economics,* **30** (February 1948), 1–28; Holbrook Working, "The Theory of the Price of Storage," *American Economic Review,* **31** (December 1949), 1254–1262.

placed, the processor has fixed the rate of return to be earned if both the cash and the futures contract are held to maturity. For this reason the relation between the futures price and the cash price must be sufficient for the processor to recoup the net costs of storage from one time period to another.

If the first axiom of hedging is that cash and future prices tend to move in the same direction, the second general principle is that the price of the cash commodity and its futures price must become equal in the delivery month. If the futures price were higher than the cash price, the cash commodity would be bought, the futures sold, and delivery made. If the cash price were higher than the futures price, the processor would buy the futures and take delivery as the most desirable source of supply. Many traders notice, however, that cash prices are usually higher than the futures during the delivery month, and they wonder why they cannot buy the futures, take delivery, sell the commodity in the cash market, and pocket the difference. There are several reasons for the cash premium.[11] One is that cash and futures are not perfect substitutes until the last day of the month, which occurs after futures trading in that particular contract has ceased. Until that point, because delivery is made at the seller's option, the precise time of delivery is not known. This uncertainty can inject a premium into the cash commodity, which tends to decrease as the delivery month progresses. Factors among others that may be included are not knowing the precise quality of commodity that will be delivered and the possible inclusion of load-out or switching charges.

The trader should remember that there need be no particular incentive to deliver just because there is a gap between cash and expiring future prices. If lower demand is anticipated, the early-month deliverer may reason that the recipient (most likely a speculator) will have no use for the actual commodity and will have to redeliver (perhaps many times), while relieving the deliverer of storage charges. The merchant can deliver early in the month, fully expecting to stand for delivery again later in the month.

Tactics formulated by hedgers attempting to profit from movements in the basis revolve about four basic possibilities which may accompany either the short or the long hedge. A selling hedge or a buying hedge can be placed in a carrying-charge market or an inverted market, and price levels may increase or decrease after the placement of the hedge. Table 2-1

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[11] As discussed by Thomas A. Hieronymus, *Economics of Futures Trading* (New York: Commodity Research Bureau, 1971), pp. 152–153.

summarizes the possible outcomes from differences in cash and futures price movements. Generally, in a carrying-charge market, which is most common, merchants and dealers will buy the cash product freely because they are able to sell futures contracts favorably against their cash position, knowing that the premiums on the forward futures contracts will pay part or all of their carrying charges. The futures contract chosen will depend on the length of time that the merchant expects to hold the cash position and on which of the futures months traded is most favorably priced in relation to the others at the time the hedge is placed. A dealer or merchant who is long in the cash market and short hedged is, in effect, "long the basis"; that is, if the basis increases because the cash price gains on the futures month in which the hedge is placed, the hedger will make a profit by the amount of the improvement. Similarly, a merchant who has made a forward commitment to sell a cash commodity and places a long hedge by buying a futures position against the commitment is "short the basis." If cash prices drop in relation to the futures month in which the hedge is placed, the merchant will profit; if they gain, the merchant will lose.

When forward months are selling at discounts to nearby months, a buyer of the cash commodity has an especially difficult problem. If short hedges are placed in months selling at a discount, the buyer knows that cash and futures prices will tend to draw together as time passes and that there will not be a significant difference when the forward month becomes the cash month. This means that the basis will almost certainly become smaller, and because the buyer is long the basis, he or she will lose accordingly. The difficulty of hedging in such markets is even more apparent when it is noted that the degree of inversion is virtually unlimited, whereas in a carrying-charge market, as already discussed, the degree of the carrying charge is limited by the possibilities of arbitrage.

Even under such conditions hedging may take place. Many hedges are placed for short periods, during which the unfavorable basis may not change or may become even more unfavorable, in which case a basis profit may even be realized. Alternatively, a cash dealer could buy "hand to mouth," perhaps buying only to fill orders in hand, or, if orders are held for future delivery, the dealer can cover the commitment by buying the relatively cheap forward futures contracts rather than the presently high-priced cash commodity. This places the dealer in the position of having a long hedge, which makes the dealer short the basis. Later the dealer can meet the commitment by buying in the cash market and selling the futures contract or taking delivery against the long futures position if the time,

TABLE 2–1

Variations in Gains or Losses Resulting from Differences in Cash and Futures Price Movements

Price Movements		*Results*			
		To one who is "long" in the cash market		*To one who is "short" in the cash market*	
Cash price	**Futures price**	**Unhedged**	**Hedged**	**Unhedged**	**Hedged**
Falls	Falls by same amount as cash	Loss	Neither profit nor loss	Profit	Neither profit nor loss
Falls	Falls by greater amount than cash	Loss	Profit	Profit	Loss
Falls	Falls by smaller amount than cash	Loss	Loss, but smaller than unhedged loss	Profit	Profit, but smaller than unhedged profit
Falls	Rises	Loss	Loss, but greater than unhedged loss	Profit	Profit, but greater than unhedged profit
Rises	Rises by same amount as cash	Profit	Neither profit nor loss	Loss	Neither profit nor loss
Rises	Rises by greater amount than cash	Profit	Loss	Loss	Profit
Rises	Rises by smaller amount than cash	Profit	Profit, but smaller than unhedged profit	Loss	Loss, but smaller than unhedged loss
Rises	Falls	Profit	Profit, but greater than unhedged profit	Loss	Loss, but greater than unhedged loss

Source: B. S. Yamey, "An Investigation of Hedging on an Organized Produce Exchange," *Manchester School*, **19** (1951), 308.

grade, and location of delivery all meet his or her requirements satisfactorily.

An oversimplified example illustrates the possible actions of a dealer in cash corn. Assume that in November the dealer has bought some cash corn from the country at $3.15 a bushel. Pending its sale to a processor or exporter, the dealer decides for any of myriad reasons to place a short hedge, assuming that she has no commitment for the sale of the corn. Perhaps corn for March delivery is then selling for $3.21 on the Chicago Board of Trade and the March contract is regarded as most satisfactory for hedging purposes. The dealer therefore may decide to sell an amount of March corn approximately equal to her cash position. Having placed a short hedge, she is now long the basis. When she sells her corn, the hedge will be removed, or lifted. If the price of corn in the futures market has moved up or down by the same amount as that of cash corn, the cost of hedging to the dealer is her commissions. In practice, of course, the dealer must consider related costs, such as the costs of moving the corn into storage, holding it, and moving it out again, all of which could have been avoided by selling the corn immediately after buying it. Typically, the cash and futures prices will move in the same general direction but not in exactly the same degree. If the cash price gains on the future, the basis will have widened and there will be a basis profit on the hedge itself. If the basis narrows, there will be a basis loss by the amount that it narrowed. With so little time between November and March, a material loss resulting from the cash price losing in relation to the futures is unlikely because in March they should differ by little or nothing. A large basis loss is therefore not a great risk.

The sale of the March futures contract could be made to another hedger who is short the cash market; to a hedger long the cash market who has sold his cash position and is now lifting, or buying in, his hedge; or to a speculator who is going long or covering a short position. The short position in the March contract can ultimately be eliminated in one of two ways. The dealer can wait until March and deliver her corn against the contract, or she can sell her cash corn on the cash market and lift her hedge either by offsetting it by purchase or by transferring the position to the new holder of the cash corn, who might also choose to be hedged in the March futures month. The latter procedure is so common that the transfer of the futures position itself frequently forms the basis for determining the selling price of the cash position. For example, a sale may be made at "3 cents under March," but exactly what is March? The price of March corn might vary several cents during the course of one trading day. A determination can be made simply by the dealer buying in her own March position for the purchaser of her cash corn and setting the price from that transaction. Such deals are given different names on different exchanges, such as "ex-pit transactions" or "sales against actuals." In these transactions the brokers agree to report identical prices to the clearinghouse without actually executing the trades.

If, in the example, March arrived and the cash corn which had been hedged was not yet sold, the hedger still might not deliver against her futures contract. She might conclude that the cash market was too low and, noting that the premium of the May futures contract over the March premium was favorable, might choose to buy in her March contract (offset) and remain hedged by selling May. This is called "rolling forward." If the dealer had known in November what she came to know in March, she could, of course, have saved a commission by selling the May corn as a hedge in the first place. It is obvious that if the basis had narrowed while the dealer was in a hedged position—that is, cash lost on the future—a loss on the basis would have been suffered.

Like speculators, hedgers must deposit margin against their positions, although normally their margin requirements are considerably less than those required for speculators. Sometimes margin may be handled by the hedger's bank. In such cases confirmations or statements involved in transactions will be provided for the bank as well as the hedger. Hedging involves certain costs, such as commissions and interest on margin requirements, but these may be regarded as costs of doing business. Most banks are willing lenders for hedging purposes and may be cautious about making loans to firms carrying large unhedged positions in the commodity markets. To some hedgers the ease of procuring cash loans may be the most important advantage of using the futures markets.

Because price relations are complex and the users of futures markets include producers, warehousers, merchants, and processors, hedging carried out to profit from movements in the basis requires detailed knowledge and skill in interpretation to be successful. An excellent summary of the specific needs, practices, and behavior of the individual trade user is offered by Hieronymus[12] and Arthur.[13]

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[12] Ibid., pp. 171–240.

[13] Arthur, op. cit., pp. 137–314.

Hedging Carried Out to Maximize Expected Returns for a Given Risk (Variability of Return) or Minimize Risk for a Given Expected Return

Recent studies have applied portfolio theory to hedging behavior.[14] The hedger is viewed as being able to hold several assets: for example, unhedged inventory, inventory hedged by a sale of futures, and inventory hedged by a forward cash sale are all possible decisions by the hedger, depending on the probability of the rate of return on each asset. The hedger herself is considered as acting in concert with her own utility for risk and reward and the inevitable play-off between the two at any given time in much the same way as the individual trader responded, as described in Chapter 5.

The theoretical studies are an attempt to formalize a discussion of hedging behavior and are based on the Markowitz theory of portfolio selection.[15] Further discussions of the models suggested in the literature are technical and are beyond the scope of this book. The implications of portfolio theory for understanding the nature of the futures markets are clear, however. The theory emphasizes that "risk is inherent in all marketing and processing strategies, not only those in which hedging does not take place, i.e., that futures markets facilitate 'risk management' rather than 'risk transferral.' "[16]

Any business contemplating the use of the futures markets as a management tool for choosing between various sets of marketing and processing strategies should answer initially several questions simply as a test of relevance.[17] These questions should include, What business are we in? What are the critical profit factors? How do price changes affect the critical factors? How do price change impacts compare with changes in the futures markets? Assuming that the answers to these questions indicate that risk management incorporating futures can contribute to the overall business objectives, varying points of view in developing hedging policies

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[14] David J. S. Rutledge, "Hedgers' Demand for Futures Contract: A Theoretical Framework with Applications to the United States Soybean Complex," *Food Research Institute Studies,* **11** (1973), 237–256.

[15] H. Markowitz, *Portfolio Selection—Efficient Diversification of Investments* (New Haven: Yale University Press, 1959).

[16] Rutledge, op. cit., 254.

[17] Henry B. Arthur, "The Many Facets of Commodity Futures as a Tool of Management," *Workshop/72* (Coffee and Sugar Exchange, 1972), p. 36.

may be considered. Exhibit 2-1 attempts to structure these views.[18] Each of the column headings relates a business management function or interest. The first column assumes total independence of cash and hedging considerations. Hedging is employed merely to offset all or some of the net inventory price risks as they occur. The second column begins building the futures contract into the business operation, columns 3 and 4 include specific procurement and marketing functions which accent decision making by those responsible for the operations, and column 5 reflects the most sophisticated use of hedging. The vertical shading of the first panel is suggestive of the degree of risk incurred, which increases as the listings progress from top to bottom. The range includes an attempt at risk avoidance on the one hand and brash opportunism on the other. Real-world practices lie somewhere in between.

Critical Comment

The main purpose of including a discussion of the theory and practice of hedging is to educate the trader in the singular truth that futures trading depends on hedging. Two additional purposes must share top priority, however. The first is that the treatment of the vast majority of the literature with which the trader is most likely to come in contact is naive, if not outright incorrect. The most charitable judgment one can make of these approaches is that they are exactly what they claim to be—oversimplified examples. Many commission house offerings, as well as much of the early literature, tend to perpetuate pleasant myths in the interest of obviating the need for their own understanding and that of their readership.[19]

The second purpose of a discussion of hedging is to impress on the average trader the probable futility of attempting to relate a significant amount of this knowledge to the improvement of his or her own record. The differences of opinion and practices as well as the intricacies of the variables involved make it all but impossible to reduce the outcomes to general rules for the improvement of trading effectiveness. Better by far that the trader applaud the consistent use of well-traveled markets by the trade, the expansion of those markets that may have fallen into comparative disuse,

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[18] Ibid., p. 42, op. cit., pp. 336–337.

[19] Since 1981 a considerable amount of scholarly work on hedging theory and practice has been published in *The Journal of Futures Markets,* published quarterly by John Wiley & Sons in affiliation with the Center for the Study of Futures Markets, Columbia Business School. The quality of studies in this journal is usually quite high.

EXHIBIT 2–1

Points of View in Developing Hedging Policies

Shading from protection to exposed position Primary guide or → purpose	Net position control (inventory risk)[1]	Gross position[2] (total commitment factors—"a larger market")	Procurement tool (time and cost)	Marketing tool (time and price)	Profit margins and incentives[3]
▓	1. Fully hedged (zero net position) Large volume "basis" operators 2. Partial hedge (constant, not zero, net position) Examples: Exclude Lifo base; hedge only seasonal accumulation 3. Variable hedge (planned or budgeted net position) Examples: Headquarters managed hedge; discretionary position within limits 4. Variable hedge (deliberate variances to profit from price swings) Examples: Cyclical position taking; leaning into the wind; special position taking situation	1. Maximize turnover without net exposure 2. Spreading and arbitrage[4] 3. Hedge excess over Lifo base 4. Hedge seasonal storage 5. Use of futures to economize cash tied up in inventories, or to shorten exposure without sacrificing current throughout 6. Disregard business needs; straight speculation	1. Take delivery on futures markets to get needed goods 2. Lock in margin through low-costing raw material (to cover a sale commitment) 3. Assure repurchase of temporarily liquidated Lifo base stocks 4. Anticipate storage accumulation by purchase of new crop futures 5. Use futures to attain target exposure when actuals not available 6. Pin down attractive cost for anticipated needs 7. Reach out, speculate regardless of commercial needs	1. Deliver actuals on futures market 2. Sell futures to lock in realization on goods in inventory 3. Sell futures to assure price for anticipated production 4. Cover risks on unpriced sales, requirements contracts, or "price date of delivery" 5. Liquidate unwanted risk by selling futures when cash won't move 6. Sell futures farther ahead than actuals can be booked in the market	1. Lock in margin where actuals are bought or sold on formula price to be based on later futures quotations 2. Deal in basis (this covers a wide assortment of specialized applications) 3. Use price or margin targets to determine how much business will be done, as in deciding how much to store or process 4. Pin down other half of a cash commodity trade in futures, awaiting opportunity to fulfill with actuals 5. Buy low, sell high, wherever the opportunity presents itself—all cash, all futures, or a mix including discretionary position taking

[1] This column assumes a commercial operation in which all decisions are based on cash market considerations. The net cash positions (or portions of them) are then hedged in futures.

[2] This column assumes that added cash positions will be undertaken simply because they *can* be hedged.

[3] The column for profit margins and incentives relates to operations in which the primary focus is not on protection from general price swings, but on earnings from residuals and differentials (basis), or even from deliberate position taking.

[4] Includes earning of storage by holding deliverable cash product against short futures. This is sometimes referred to as "cash and carry."

Source: Henry B. Arthur, *Commodity Futures as a Business Management Tool,* Division of Research, Graduate School of Business Administration, Harvard University, Cambridge, Mass., 1971, pp. 336–337.

and the emergence of new markets (for example, for currencies, interest rates, stock indexes, petroleum, aluminum, and exchange-traded options on futures) which consolidate, renew, and expand opportunities for rewarding speculation.

The trader has been introduced to the nature of the futures contract and the considerable recent growth in its use. The nature of the exchanges that trade these contracts has been discussed, and portraits of the speculator and hedger which included the impact of each on the open interest have been drawn. Cash and futures price relationships were analyzed to give the trader an appreciation of the complexities of the hedging process.

At this point it might help to ask, "How well do the markets function?" The experienced trader may retort wryly. "Too well. They're *so* tough to beat." The trader, of course, is referring to the behavior of futures prices, which is of such importance that Chapter 4 is devoted entirely to a discussion of the characteristics of price changes. In a general sense, however, there has always been an implicit benchmark for judging whether futures markets should receive high or low performance marks. Because agricultural and raw materials commodities, which are featured in most futures markets, are subject to considerable price fluctuations (many are beyond the control of the producer or processor), markets that receive high performance marks are those in which there has been a noticeable reduction in price variability.

The question of price variability may be viewed generally from two positions—either that futures trading, in an institutional sense, tends to dampen or increase price fluctuations or that speculation itself significantly influences the variability of price changes. The various attacks on potato and onion futures trading as an institution[20] seemed to make more headway when price levels were depressed, just as similar investigations of the coffee, copper, and sugar markets were launched when prices were high. Some scholars have wondered about the pattern that exhibits concern for the *producer* of domestic commodities and the *consumer* of imported commodities.[21] Apart from such obvious bias, there is a continuing question whether the institution itself is worthy of the increasing trust that has been shown in its regard. A discussion of speculation and price variability follows later in the section.

One of the early dissatisfactions with market performance centered around the question of manipulation, which features corners and bear raids

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[20] See Chapter 1.

[21] Gray and Rutledge, op. cit., 32.

in the finest robber baron tradition.[22] Activity by such men as Hutchinson, Leiter, and Pattern in the years just before the turn of the century resulted in short-term price distortions, frequently because of inadequate supplies of a grain in the delivery position. The effectiveness of such corners gradually diminished as competitive balance appeared in the market, aided by legislation that now rewards the manipulator with 5 years of imprisonment, a $10,000 fine, or both.

Historical evidence of the effects of futures trading on price fluctuations is not conclusive. Perhaps the most voluminous example of the divergent findings was provided by the U.S. Federal Trade Commission,[23] which in part concluded:

> Frequently attempts have been made to deal with the question of the stabilizing effect of future trading by comparing periods prior to the practice of trading in futures with periods since there has been such trading. Such a comparison, in order to prove anything, must first prove that the other things are equal—either that there have been no other changes between the two periods or that any other changes that may have occurred had no effect on the fluctuation of grain prices. Obviously, no such proof can be offered in the case under consideration . . . [vol. VI, p. 261].
>
> It seems to be conclusively proved by this bit of analysis that futures trading under existing conditions itself generates certain elements of risk and uncertainty. In other words, it causes some fluctuations. Its stabilizing influence must, therefore, depend upon its stilling or checking other causes of fluctuation that are more important than those it creates [vol. VI, p. 264].

Researchers have estimated the effect of the introduction of futures trading on the price of numerous commodities, ranging from onions to stock index futures. The overwhelming majority of studies have found that the introduction of futures trading in stock indices does not result in increased volatility of the underlying stocks. Where an increase is found, it is usually short-term (intraday) volatility. Studies examining other futures found that the introduction of derivatives trading tends to either decrease volatility or result in no change.[24]

As the trader may surmise by now, there can be no single meaning in the term "price variability." A look at continuous and discontinuous inven-

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[22] C. H. Taylor, *History of the Board of Trade of the City of Chicago* (Chicago: Robert O. Law Co., 1917).

[23] *U.S. Industrial Commission Report* (1900–1901), House Doc. 94, 56th Cong. 2d Sess. House.

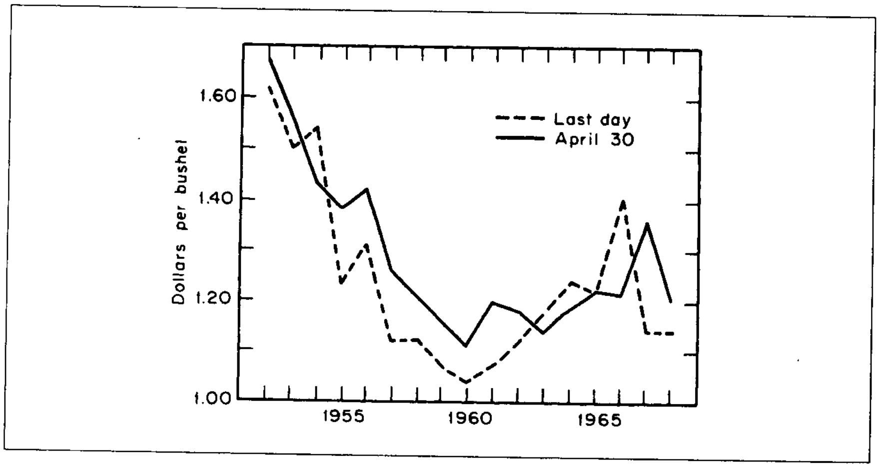
[24] Donald L. Horowitz, and Robert J. Mackay, "Derivatives: State of the Debate" (October 1995), study sponsored by the Chicago Mercantile Exchange.

tory futures markets will illustrate the variations.[25] In continuous inventory markets the price-of-storage theory ensures that the level of prices for *all* months responds to change in information as it develops. Of course, the interrelations between cash prices and futures prices (the basis) change, but these changes are generally much smaller than absolute price changes, as discussed earlier. When no inventories are carried, the function of a futures market is to conduct "forward pricing" (forecasting), and the relations among prices differ from the first case. Figures 2-2, 2-3, and 2-4 present price behavior in three crops for which production decisions take place in the spring before a fall harvest—corn, soybeans, and potatoes.

In each case the closing prices for December corn, November soybeans, and November potatoes on April 30 are compared with expiration prices for a number of years. Corn and soybean prices depict a tendency to move together (low variability), whereas the last-day (cash) price of potatoes is clearly much more variable than the futures price throughout the

FIGURE 2-2

Closing prices of December corn contract on April 30 and expiration date, 1952–1968.



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[25] As developed by William G. Tomek and Roger W. Gray, "Temporal Relationships among Prices on Commodity Futures Markets: Their Allocative and Stabilizing Roles," *American Journal of Agricultural Economics*, **52**, No. 3 (August 1970).

FIGURE 2-3

Closing prices of November soybean contract on April 30 and expiration date, 1952–1968.

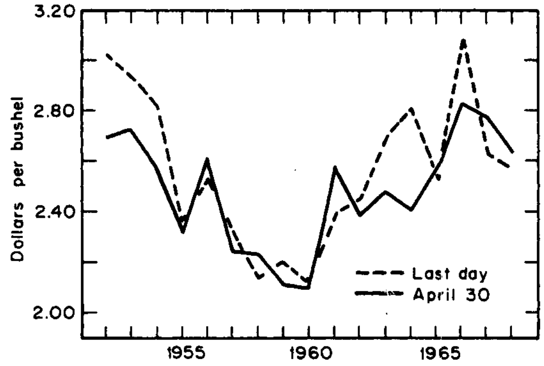
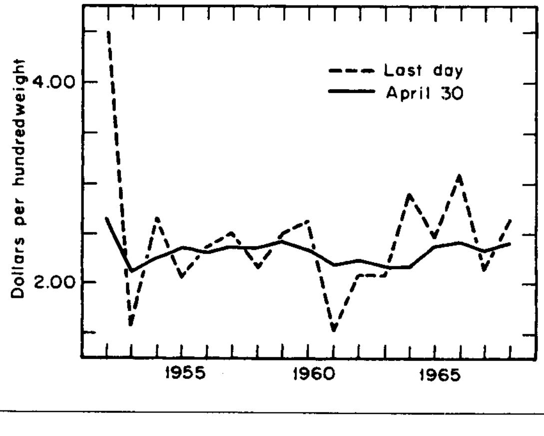


FIGURE 2-4

Closing prices of November Maine potato contract on April 30 and expiration date, 1952–1968.



years analyzed. The implications from the standpoint of the *growers'* ability through hedging to reduce price variability from year to year are interesting. Because no potato stocks are carried from May to November, the market in the spring cannot forecast any price other than the mean November price until new crop information emerges. A forecast at the mean value of past observations, when coupled with a near zero variance in springtime prices, provides an excellent basis for hedging. On the other hand, as in the corn and soybean markets, routine hedging may not be helpful in reducing annual price variability because the variance in the springtime prices is about equal to the variance in the cash prices at maturity. In summation, then, as Gray and Rutledge note in their survey,

> . . . the potato grower can greatly reduce *his* price variability through hedging, as the corn and soybean grower cannot. But it is implied on the *other* sides of these coins that corn and soybean price variabilities have been reduced (through generalized production and inventory response) as potato price variability has not.[26]

The question whether speculation itself significantly influences the variability of prices is one of long standing. Many unresolved questions owe their longevity primarily to problems of measurement, and the role of speculation is no exception. Examples of the data on open interest, available from the CFTC, are presented in Tables 2-2 and 2-3; the indicated commitments are divided into reportable (large) positions and nonreportable (small) positions. Reportable commitments are divided into noncommercial and commercial categories. The former can be assumed to include speculators and the latter hedgers. Small traders are residual, that is, the difference between the reporting traders and the total positions indicated by the exchanges. Although most nonreportable positions undoubtedly are held by small speculators, there is an unknown quantity of small hedging positions included in this category.

A considerable amount of statistical information which summarizes or refines the open-interest data discussed briefly here is prepared by the economic analysis specialists of the CFTC and is available from the commission.

Because the terms "excessive speculation" and "undue price fluctuations" are subjective and the CFTC figures are the major source of reference, the trader can appreciate the problem of assessing the impact of the

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[26] Gray and Rutledge, op. cit., 35.

TABLE 2–2

Sample Commitment of Traders Report (Long Version), 11/05/97

Reportable Positions							*Nonreportable Positions*	
Noncommercial			*Commercial*		*Total*			
Long	**Short**	**Spreading**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
Wheat—Chicago Board of Trade				Open Int: 520,295 (505)				
110,480	60,200	37,955	190,035	290,755	338,470	388,910	181,825	131,385
–1,955	4,900	865	–5,520	–9,270	–6,610	–3,505	7,115	4,010
21.2	11.6	7.3	36.5	55.9	65.1	74.7	34.9	25.3
48	33	23	45	50	108	101		
Corn—Chicago Board of Trade				Open Int: 1,978,425 (–54,060)				
443,550	72,280	84,595	789,345	1054410	1317490	1211285	660,935	767,140
–58,905	–18,570	–10,035	7,175	–56,680	–61,765	–85,285	7,705	31,225
22.4	3.7	4.3	39.9	53.3	66.6	61.2	33.4	38.8
106	38	38	153	189	283	254		
Oats—Chicago Board of Trade				Open Int: 59,110 (–4,260)				
12,080	720	2,555	19,835	43,635	34,470	46,910	24,640	12,200
–2,950	720	–1,245	825	–3,205	–3,370	–3,730	–890	–530
20.4	1.2	4.3	33.6	73.8	58.3	79.4	41.7	20.6
9	2	2	11	15	21	19		
Soybeans—Chicago Board of Trade				Open Int: 753,775 (–37,050)				
135,330	70,970	57,515	290,500	371,580	483,345	500,065	270,430	253,710
13,489	–2,795	–10,345	–38,870	–19,021	–35,726	–32,161	–1,324	–4,889
18.0	9.4	7.6	38.5	49.3	64.1	66.3	35.9	33.7
73	45	43	68	89	168	160		

Description of CFTC Commitment of Traders (COT) Report

This file is a condensed version of the COT report. Each file contains the actual untouched numbers released by the CFTC as of the date indicated. Commodities are listed by exchange and consists of four lines of data as described below:

Line 1: Contains the Market (ex. CBT), Commodity (ex. SOYBEANS), Total Open Interest (ex. 1,009,055), and change in open interest from previous report (ex. –15,180, where negative value implies a decrease).

Line 2: The actual holdings (commitments) of each category as reported by the CFTC.

Line 3: Change in holdings of each category from the previous report. For example, a value of 1,027 would imply the holdings of this category has increased by 1,027 contracts.

Line 4: Percent of open interest represented by each category. Calculated by dividing the current holdings (line 2) by the total open interest (Line1).

Line 5: Number of traders in each category. Since nonreportable traders do not submit reports, the number of traders for this category is unknown. Their positions, however, are determined by subtracting the known positions of the reportables form the total open interest.

Note: Not all markets in included in this report.

Source: Pinnacle Data Corporation (716) 872-0845.

TABLE 2–2

Sample Commitment of Traders Report (Long Version), 11/05/97 (*Continued*)

Reportable Positions							***Nonreportable Positions***	
Noncommercial			***Commercial***		***Total***			
Long	**Short**	**Spreading**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
Soybean Oil—Chicago Board of Trade					Open Int: 112,429 (–1,184)			
40,437	2,102	5,969	24,495	84,275	70,901	92,346	41,528	20,083
971	230	–1,492	–1,131	–752	–1,652	–2,014	468	830
36.0	1.9	5.3	21.8	75.0	63.1	82.1	36.9	17.9
48	9	15	29	33	87	53		
U.S. Treasury Bonds—Chicago Board of Trade					Open Int: 696,195 (–12,556)			
78,822	60,129	52,550	442,271	485,209	573,643	597,888	122,552	98,307
2,129	–12,034	–5,259	–4,765	19,317	–7,895	2,024	–4,661	–14,580
11.3	8.6	7.5	63.5	69.7	82.4	85.9	17.6	14.1
37	38	24	97	112	149	161		
NO. 2 Heating Oil, N.Y. Harbor—New York Mercantile Exchange					Open Int: 123,070 (–11,528)			
10,709	5,320	2,448	52,727	83,674	65,884	91,442	57,186	31,628
–148	–517	14	–7,281	–5,160	–7,415	–5,663	–4,113	–5,865
8.7	4.3	2.0	42.8	68.0	53.5	74.3	46.5	25.7
13	6	3	35	45	50	52		
Natural Gas—New York Mercantile Exchange					Open Int: 233,025 (–19,903)			
25,770	4,859	13,639	137,100	178,092	176,509	196,590	56,516	36,435
–1,050	–2,175	–1,750	–8,651	–5,407	–11,451	–9,332	–8,452	–10,571
11.1	2.1	5.9	58.8	76.4	75.7	84.4	24.3	15.6
49	19	21	81	76	145	108		
Soybean Meal—Chicago Board of Trade					Open Int: 122,356 (4,381)			
22,742	4,289	7,795	46,369	82,501	76,906	94,585	45,450	27,771
1,476	–471	–565	2,805	3,890	3,716	2,854	665	1,527
18.6	3.5	6.4	37.9	67.4	62.9	77.3	37.1	22.7
44	14	21	33	45	89	73		
Cotton No. 2—New York Cotton Exchange					Open Int: 97,091 (1,194)			
8,542	29,993	2,674	61,712	48,408	72,928	81,075	24,163	16,016
281	–2,326	–614	720	2,621	387	–319	807	1,513
8.8	30.9	2.8	63.6	49.9	75.1	83.5	24.9	16.5
42	74	20	83	44	139	128		

TABLE 2–2

Sample Commitment of Traders Report (Long Version), 11/05/97 (*Continued*)

Reportable Positions							***Nonreportable Positions***	
Noncommercial			***Commercial***		***Total***			
Long	**Short**	**Spreading**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
Frzn Concentrated Orange Juice—New York Cotton Exchange					Open Int: 39,921 (–744)			
15,322	4,133	997	3,854	29,678	20,173	34,808	19,748	5,113
–23	–190	–64	–272	–87	–359	–341	–385	–403
38.4	10.4	2.5	9.7	74.3	50.5	87.2	49.5	12.8
60	23	9	7	24	73	51		
13-Week U.S. Treasury Bills—Chicago Mercantile Exchange					Open Int: 10,752 (1,068)			
1,275	251	2,228	2,588	6,613	6,091	9,092	4,661	1,660
–296	51	576	1,439	598	1,719	1,225	–651	–157
11.9	2.3	20.7	24.1	61.5	56.6	84.6	43.4	15.4
4	2	1	3	9	8	11		
2-Year U.S. Treasury Notes—Chicago Board of Trade					Open Int: 38,398 (1,179)			
505	1,109	29	32,225	28,844	32,759	29,982	5,639	8,416
–26	–364	0	1,794	278	1,768	–86	–589	1,265
1.3	2.9	0.1	83.9	75.1	85.3	78.1	14.7	21.9
2	2	1	25	43	27	46		
10-Year U.S. Treasury Notes—Chicago Board of Trade					Open Int: 399,454 (510)			
47,239	26,638	13,053	273,247	294,500	333,539	334,191	65,915	65,263
–3,396	3,407	–1,555	1,766	–662	–3,185	1,190	3,695	–680
11.8	6.7	3.3	68.4	73.7	83.5	83.7	16.5	16.3
22	21	14	68	97	98	124		
5-Year U.S. Treasury Notes—Chicago Board of Trade					Open Int: 242,755 (10,343)			
52,441	26,673	2,326	159,361	178,273	214,128	207,272	28,627	35,483
–161	–3,671	233	10,005	14,355	10,077	10,917	266	–574
21.6	11.0	1.0	65.6	73.4	88.2	85.4	11.8	14.6
22	20	3	60	108	83	130		
30-Day Federal Funds—Chicago Board of Trade					Open Int: 18,450 (–6,472)			
1,413	2,015	1,271	13,160	12,025	15,844	15,311	2,606	3,139
–154	–1,235	–47	–6,375	–4,914	–6,576	–6,196	104	–276
7.7	10.9	6.9	71.3	65.2	85.9	83.0	14.1	17.0
4	8	7	20	26	29	39		

TABLE 2–2

Sample Commitment of Traders Report (Long Version), 11/05/97 (*Continued*)

Reportable Positions							***Nonreportable Positions***	
Noncommercial			***Commercial***		***Total***			
Long	**Short**	**Spreading**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
Lean Hogs—Chicago Mercantile Exchange					Open Int: 37,918 (588)			
6,869	12,035	2,778	17,282	13,699	26,929	28,512	10,989	9,406
81	–214	–286	204	1,614	–1	1,114	589	–526
18.1	31.7	7.3	45.6	36.1	71.0	75.2	29.0	24.8
38	40	13	15	19	57	68		
Pork Bellies—Chicago Mercantile Exchange					Open Int: 7,473 (–29)			
1,122	3,808	280	2,767	1,170	4,169	5,258	3,304	2,215
–180	–281	123	–128	72	–185	–86	156	57
15.0	51.0	3.7	37.0	15.7	55.8	70.4	44.2	29.6
10	30	6	15	5	30	36		
Live Cattle—Chicago Mercantile Exchange					Open Int: 94,816 (3,834)			
15,395	14,681	5,916	32,899	40,296	54,210	60,893	40,606	33,923
1,245	–739	351	–349	2,715	1,247	2,327	2,587	1,507
16.2	15.5	6.2	34.7	42.5	57.2	64.2	42.8	35.8
37	44	21	39	50	89	109		
Random Length Lumber—New—Chicago Mercantile Exchange					Open Int: 3,739 (195)			
728	1,160	228	271	566	1,227	1,954	2,512	1,785
–116	382	60	54	–16	–2	426	197	–231
19.5	31.0	6.1	7.2	15.1	32.8	52.3	67.2	47.7
14	13	5	8	9	24	25		
Feeder Cattle—Chicago Mercantile Exchange					Open Int: 16,989 (–578)			
2,839	4,877	1,516	4,276	3,472	8,631	9,865	8,358	7,124
–123	302	–192	–477	–208	–792	–98	214	–480
16.7	28.7	8.9	25.2	20.4	50.8	58.1	49.2	41.9
14	26	8	22	17	42	47		
Propane Gas—New York Mercantile Exchange					Open Int: 2,901 (–451)			
43	21	56	1,870	2,309	1,969	2,386	932	515
–13	21	25	–369	–472	–357	–426	–94	–25
1.5	0.7	1.9	64.5	79.6	67.9	82.2	32.1	17.8
1	1	1	24	13	26	14		

TABLE 2–2

Sample Commitment of Traders Report (Long Version), 11/05/97 (*Continued*)

Reportable Positions							***Nonreportable Positions***	
Noncommercial			***Commercial***		***Total***			
Long	**Short**	**Spreading**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
Crude Oil, Light "Sweet"—New York Mercantile Exchange					Open Int: 394,376 (–9,667)			
28,934	15,300	19,881	257,263	270,124	306,078	305,305	88,298	89,071
–2,939	1,201	–253	855	–1,424	–2,337	–476	–7,330	–9,191
7.3	3.9	5.0	65.2	68.5	77.6	77.4	22.4	22.6
27	22	15	59	70	96	98		
Cocoa—Coffee, Sugar & Cocoa Exchange					Open Int: 102,717 (–1,963)			
14,239	8,370	2,140	71,625	80,234	88,004	90,744	14,713	11,973
64	2,219	–428	102	–2,506	–262	–715	–1,701	–1,248
13.9	8.1	2.1	69.7	78.1	85.7	88.3	14.3	11.7
29	19	13	28	42	62	70		
Palladium—New York Mercantile Exchange					Open Int: 4,228 (–148)			
1,392	30	0	1,938	3,445	3,330	3,475	898	753
–167	–246	0	13	72	–154	–174	6	26
32.9	0.7	0.0	45.8	81.5	78.8	82.2	21.2	17.8
14	1	0	12	20	26	21		
Platinum—New York Mercantile Exchange					Open Int: 12,687 (341)			
4,652	1,627	113	5,170	9,376	9,935	11,116	2,752	1,571
–57	62	0	986	127	929	189	–588	152
36.7	12.8	0.9	40.8	73.9	78.3	87.6	21.7	12.4
21	10	1	16	20	37	31		
Sugar No. 11—Coffee, Sugar & Cocoa Exchange					Open Int: 197,655 (37,005)			
80,091	7,067	3,235	47,844	151,059	131,170	161,361	66,485	36,294
29,043	–3,971	1,238	–7,770	33,448	22,511	30,715	14,494	6,290
40.5	3.6	1.6	24.2	76.4	66.4	81.6	33.6	18.4
63	9	7	31	42	98	55		
Coffee C—Coffee, Sugar & Cocoa Exchange					Open Int: 26,940 (1,050)			
2,417	5,320	881	13,138	11,404	16,436	17,605	10,504	9,335
468	251	–334	387	263	521	180	529	870
9.0	19.7	3.3	48.8	42.3	61.0	65.3	39.0	34.7
22	34	9	60	36	87	74		

TABLE 2-2

Sample Commitment of Traders Report (Long Version), 11/05/97 (*Continued*)

Reportable Positions							***Nonreportable Positions***	
Noncommercial			***Commercial***		***Total***			
Long	**Short**	**Spreading**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
Silver—Commodity Exchange Inc.					Open Int: 95,965 (3,118)			
31,952	16,542	14,327	22,904	53,076	69,183	83,945	26,782	12,020
2,166	1,469	1,316	525	1,338	4,007	4,123	–889	–1,005
33.3	17.2	14.9	23.9	55.3	72.1	87.5	27.9	12.5
33	13	9	20	33	60	50		
Copper—Grade 1—Commodity Exchange Inc					Open Int: 63,910 (1,069)			
13,264	12,781	1,358	26,659	32,781	41,281	46,920	22,629	16,990
391	1,348	2	990	–723	1,383	627	–314	442
20.8	20.0	2.1	41.7	51.3	64.6	73.4	35.4	26.6
20	32	4	38	22	58	58		
Gold—Commodity Exchange Inc.					Open Int: 217,937 (112)			
8,017	71,591	16,039	151,730	91,958	175,786	179,588	42,151	38,349
900	–32	1,028	3,968	2,561	5,896	3,557	–5,784	–3,445
3.7	32.8	7.4	69.6	42.2	80.7	82.4	19.3	17.6
22	48	8	37	49	63	102		
Swiss Franc—International Monetary Market					Open Int: 49,711 (298)			
14,439	2,326	1,182	16,661	33,927	32,282	37,435	17,429	12,276
1,993	56	26	–193	5,701	1,826	5,783	–1,528	–5,485
29.0	4.7	2.4	33.5	68.2	64.9	75.3	35.1	24.7
12	6	1	16	30	29	36		
Deutsche Mark—International Monetary Market					Open Int: 70,769 (1,528)			
17,206	7,824	1,092	27,271	45,887	45,569	54,803	25,200	15,966
7,141	1,276	37	–3,476	5,878	3,702	7,191	–2,174	–5,663
24.3	11.1	1.5	38.5	64.8	64.4	77.4	35.6	22.6
22	17	3	27	35	51	53		
Mexican Peso—International Monetary Market					Open Int: 38,974 (–3,744)			
4,213	2,663	4,169	20,669	21,062	29,051	27,894	9,923	11,080
–3,040	–527	–1,934	511	–1,641	–4,463	–4,102	719	358
10.8	6.8	10.7	53.0	54.0	74.5	71.6	25.5	28.4
6	6	3	19	21	26	29		

TABLE 2–2

Sample Commitment of Traders Report (Long Version), 11/05/97 (*Continued*)

Reportable Positions							***Nonreportable Positions***	
Noncommercial			***Commercial***		***Total***			
Long	**Short**	**Spreading**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
Pound Sterling—International Monetary Market					Open Int: 50,125 (–1,889)			
20,979	1,497	0	9,318	40,751	30,297	42,248	19,828	7,877
–313	310	0	–5	515	–318	825	–1,571	–2,714
41.9	3.0	0.0	18.6	81.3	60.4	84.3	39.6	15.7
21	5	0	17	29	38	34		
Japanese Yen—International Monetary Market					Open Int: 108,806 (3,155)			
9,965	30,807	1	87,499	56,417	97,465	87,225	11,341	21,581
–2,710	1,877	1	14,605	3,024	11,896	4,902	–8,741	–1,747
9.2	28.3	0.0	80.4	51.9	89.6	80.2	10.4	19.8
13	18	1	32	31	46	49		
U.S. Dollar Index—New York Cotton Exchange					Open Int: 12,186 (406)			
2,007	1,866	8,483	440	0	10,930	10,349	1,256	1,837
1,133	326	355	–412	0	1,076	681	–670	–275
16.5	15.3	69.6	3.6	0.0	89.7	84.9	10.3	15.1
5	11	7	1	0	8	18		
Unleaded Gasoline, N.Y. Harbor—New York Mercantile Exchange					Open Int: 91,216 (–5,599)			
13,098	1,176	4,719	56,285	68,493	74,102	74,388	17,114	16,828
–776	553	390	–2,598	–1,882	–2,984	–939	–2,615	–4,660
14.4	1.3	5.2	61.7	75.1	81.2	81.6	18.8	18.4
20	10	10	38	61	66	75		
Municipal Bond Index—Chicago Board of Trade					Open Int: 21,693 (863)			
2,122	630	0	17,715	19,372	19,837	20,002	1,856	1,691
–177	630	0	785	163	608	793	255	70
9.8	2.9	0.0	81.7	89.3	91.4	92.2	8.6	7.8
8	1	0	12	27	20	28		
Dow Jones Industrial Average—Chicago Board of Trade					Open Int: 9,006 (1,275)			
1,894	1,913	672	5,277	3,271	7,843	5,856	1,163	3,150
678	832	248	1,558	–169	2,484	911	–1,209	364
21.0	21.2	7.5	58.6	36.3	87.1	65.0	12.9	35.0
18	24	8	13	10	34	40		

TABLE 2–2

Sample Commitment of Traders Report (Long Version), 11/05/97 (*Continued*)

Reportable Positions							***Nonreportable Positions***	
Noncommercial			***Commercial***		***Total***			
Long	**Short**	**Spreading**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
3-Month Eurodollars—International Monetary Market					Open Int: 2,796,402 (–37,820)			
215,494	119,646	192,709	1711415	1612294	2119618	1924649	676,784	871,753
13,138	–16,110	–4,708	–14,747	41,716	–6,317	20,898	–31,503	–58,718
7.7	4.3	6.9	61.2	57.7	75.8	68.8	24.2	31.2
32	39	26	104	121	153	170		
E-Mini S&P 500 Stock Index—International Monetary Market					Open Int: 15,555 (588)			
8,385	811	30	1,677	8,342	10,092	9,183	5,463	6,372
1,795	481	0	–218	1,056	1,577	1,537	–989	–949
53.9	5.2	0.2	10.8	53.6	64.9	59.0	35.1	41.0
2	2	1	3	2	5	5		
S&P 500 Stock Index—IInternational Monetary Market					Open Int: 401,572 (195,674)			
13,961	40,426	874	281,188	266,399	296,023	307,699	105,549	93,873
6,054	21,987	634	139,747	131,804	146,435	154,425	49,239	41,249
3.5	10.1	0.2	70.0	66.3	73.7	76.6	26.3	23.4
10	23	2	83	82	93	107		
Stock Index, NYSE CMP New—New York Futures Exchange					Open Int: 2,840 (–327)			
923	108	1,140	80	395	2,143	1,643	697	1,197
313	–8	160	–111	186	362	338	–689	–665
32.5	3.8	40.1	2.8	13.9	75.5	57.9	24.5	42.1
7	3	9	1	2	15	13		
NASDAQ-100 Stock Index—International Monetary Market					Open Int: 7,839 (551)			
1,026	1,350	164	5,758	5,248	6,948	6,762	891	1,077
–37	680	–23	898	–37	838	620	–287	–69
13.1	17.2	2.1	73.5	66.9	88.6	86.3	11.4	13.7
7	13	1	22	17	30	31		
Australian Dollars—International Monetary Market					Open Int: 20,224 (–1,064)			
0	8,508	0	18,348	5,000	18,348	13,508	1,876	6,716
0	–667	0	–610	40	–610	–627	–454	–437
0.0	42.1	0.0	90.7	24.7	90.7	66.8	9.3	33.2
0	8	0	14	8	14	16		

TABLE 2–2

Sample Commitment of Traders Report (Long Version), 11/05/97 (*Continued*)

Reportable Positions							Nonreportable Positions	
Noncommercial			Commercial		Total			
Long	Short	Spreading	Long	Short	Long	Short	Long	Short
Russel 2000 Stock Index Future—International Monetary Market					Open Int: 10,029 (58)			
1,604	921	31	7,625	8,752	9,260	9,704	769	325
199	389	6	53	–271	258	124	–200	–66
16.0	9.2	0.3	76.0	87.3	92.3	96.8	7.7	3.2
6	9	1	35	17	42	27		
Nikkei Stock Average—International Monetary Market					Open Int: 18,638 (–401)			
4,615	3,297	14	9,492	13,107	14,121	16,418	4,517	2,220
120	–365	–4	–91	151	25	–218	–426	–183
24.8	17.7	0.1	50.9	70.3	75.8	88.1	24.2	11.9
19	11	1	30	33	49	45		
Stock Index Fut, Eurotop 100—Commodity Exchange Inc.					Open Int: 2,395 (135)			
170	0	0	2,016	2,336	2,186	2,336	209	59
–43	0	0	159	141	116	141	19	–6
7.1	0.0	0.0	84.2	97.5	91.3	97.5	8.7	2.5
1	0	0	6	2	7	2		
Goldman-Sachs Commodity Index—International Monetary Market					Open Int: 23,493 (208)			
1,688	1,260	227	20,571	21,933	22,486	23,420	1,007	73
–77	38	127	105	71	155	236	53	–28
7.2	5.4	1.0	87.6	93.4	95.7	99.7	4.3	0.3
9	4	4	9	5	22	13		
S&P 400 Midcap Stock Index—International Monetary Market					Open Int: 11,910 (197)			
449	535	0	10,876	11,088	11,325	11,623	585	287
–44	–11	0	247	265	203	254	–6	–57
3.8	4.5	0.0	91.3	93.1	95.1	97.6	4.9	2.4
4	4	0	41	18	45	22		
3-Mo. Euroyen—International Monetary Market					Open Int: 103,847 (–3,208)			
937	5,734	2,049	69,596	59,798	72,582	67,581	31,265	36,266
44	202	–442	1,145	1,135	747	895	–3,955	–4,103
0.9	5.5	2.0	67.0	57.6	69.9	65.1	30.1	34.9
11	32	10	38	47	57	84		
Ital. Lira/Mark Xrate—New York Cotton Exchange					Open Int: 9,502 (62)			
892	5,533	0	8,484	3,577	9,376	9,110	126	392
–43	–307	0	47	289	4	–18	58	80
9.4	58.2	0.0	89.3	37.6	98.7	95.9	1.3	4.1
5	5	0	10	14	15	19		

TABLE 2–3

Commitment of Traders Report (Short Version), 11/04/97

	Noncommercial Traders			*Commercial Traders*		*Nonreporting Traders*		*Noncommercial Traders*		*Commercial Traders*	
	Long	**Short**	**Spread**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
B. pound	20979	1497	0	9318	40751	19828	7877	21	5	17	29
C. dollar	4285	29788	1107	45831	28491	22853	14690	12	26	36	20
Feeder cattle	2839	4877	1516	4276	3472	8358	7124	14	26	22	17
Live cattle	15395	14681	5916	32899	40296	40606	33923	37	44	39	50
Cocoa	14239	8370	2140	71625	80234	14713	11973	29	19	28	42
Coffee	2417	5320	881	13138	11404	10504	9335	22	34	60	36
CRB index	187	425	1140	0	0	479	241	3	6	0	0
Copper	13264	12781	1358	26659	32781	22629	16990	20	32	38	22
Corn	443550	72280	84595	789345	1054410	660935	767140	106	38	153	189
Cotton	8542	29993	2674	61712	48408	24163	16016	42	74	83	44
Crude oil	28934	15300	19881	257263	270124	88298	89071	27	22	59	70
Eurodollar	215494	119646	192709	1711415	1612294	676784	871753	32	39	104	121
Fr. franc	1413	2015	1271	13160	12025	2606	3139	4	8	20	26
D. mark	17206	7824	1092	27271	45887	25200	15966	22	17	27	35
Gold	8017	71591	16039	151730	91958	42151	38349	22	48	37	49
Heating oil	10709	5320	2448	52727	83674	57186	31628	13	6	35	45
Live hogs	6869	12035	2778	17282	13699	10989	9406	38	40	15	19
J. yen	9965	30807	1	87499	56417	11341	21581	13	18	32	31
Lumber	728	1160	228	271	566	2512	1785	14	13	8	9
Muni bonds	2122	630	0	17715	19372	1856	1691	8	1	12	27
Oats	12080	720	2555	19835	43635	24640	12200	9	2	11	15

Orange Juice	15322	4133	997	3854	29678	19748	5113	60	23	7	24
Palladium	1392	30	0	1938	3445	898	753	14	1	12	20
Platinum	4652	1627	113	5170	9376	2752	1571	21	10	16	20
Pork bellies	1122	3808	280	2767	1170	3304	2215	10	30	15	5
S&P 500	13961	40426	874	281188	266399	105549	93873	10	23	83	82
Silver	31952	16542	14327	22904	53076	26782	12020	33	13	20	33
Soybeans	135330	70970	57515	290500	371580	270430	253710	73	45	68	89
Soy meal	22742	4289	7795	46369	82501	45450	27771	44	14	33	45
Bean oil	40437	2102	5969	24495	84275	41528	20083	48	9	29	33
Sugar	80091	7067	3235	47844	151059	66485	36294	63	9	31	42
S. franc	14439	2326	1182	16661	33927	17429	12276	12	6	16	30
T-bills	1275	251	2228	2588	6613	4661	1660	4	2	3	9
30-yr bond	78822	60129	52550	442271	485209	122552	98307	37	38	97	112
10-yr note	47239	26638	13053	273247	294500	65915	65263	22	21	68	97
5-yr note	52441	26673	2326	159361	178273	28627	35483	22	20	60	108
Gasoline	13098	1176	4719	56285	68493	171127	16828	20	10	38	61
Wheat	110480	60200	37955	190035	290755	181825	131385	48	33	45	50
NYFE	923	108	1140	80	395	697	1197	7	3	1	2
Nikkei	4615	3297	14	9492	13107	4517	2220	19	11	30	33
USDX	2007	1866	8483	440	0	1256	1837	5	11	1	0
Natural gas	25770	4859	13639	137100	178092	56516	36435	49	19	81	76

Note: Lightly traded commodities will occasionally be omitted as their volume does not exceed the CFTC reporting levels

The COT index (as developed by Steve Briese) is described by the following formula:

$$\text{COT index} = \frac{\text{Current net} - \text{minimum net}}{\text{Maximum net} - \text{minimum net}}$$

where: Current net = current long positions – current short positions (for a particular group, say commercials)
Minimum net = lowest net positions that occurred over the lookback period (for that group)
Maximum net = highest net positions that occurred over the lookback period (for that group)

The COT index provides a way of measuring the current net position of a group to the range of net positions that group has experienced during the lookback period. For instance, if one believes that commercial traders provide an accurate forecast of price direction, the commercial COT index can be used to generate buy/sell signals as follows: Buy signal is triggered when the COT index is greater than 90 percent, sell signal when the index falls below 10 percent.

Source: Pinnacle Data Corporation (716) 872-0845.

speculator. Because the positions or even numbers of nonreporting traders are not available, the total amounts of hedging and speculating in the market cannot be accurately known. The simplest solution is to assume that all nonreporting traders are speculators. Working, however, attempted to reclassify these nonreporting traders as hedgers or speculators and proceeded to construct a "Speculative Index."[27]

The Speculative Index may be understood more easily by first referring to Table 2-2. On the average, long hedging does not equal short hedging; therefore, for market balance long speculation is required to offset net short hedging. If H_L = long hedging commitments, H_S = short hedging commitments, and S_L = long speculating commitments, the degree to which short hedging is balanced by long hedging = H_L/H_S and the degree to which short hedging is balanced by long speculation = S_L/H_S. Together these ratios measure the hedging and speculative responses to short hedging.

The Speculative Index (T) isolates the amount of *net* short hedging (H_S^{μ}), which must be carried by long speculation (S_L):

$$T = \frac{S_L}{H_S^{\mu}}$$

where S_L = long speculating commitments
H_S^{μ} = unbalanced short hedging commitments

In other words, long hedging (H_L) is subtracted from short hedging (H_S) to give the unbalanced short hedging commitment (H_S^{μ}). If a commodity has more long speculation (S_L) than needed to carry net short hedging (H_S^{μ}) requirements, the Speculative Index will exceed 1.

The trader must bear in mind that the Speculative Index does not distinguish between markets in which long speculating commitments are greater than short speculating commitments or vice versa. The ratio indicates only that unneeded speculation is becoming more or less important when compared with unbalanced hedging. A more serious limitation of the Speculative Index is that it ignores spread or matching positions, which can be a significant percentage of the total open interest. Working simply defined the problem away when he limited speculation to the holding of a net long or net short position for gains,[28] and Larson developed a technique for estimating the classification of the total open interest.[29] However, pre-

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[27] Holbrook Working, "Speculation on Hedging Markets," *Food Research Institute Studies,* **1,** No. 2 (May 1960), 199 ff.

[28] Ibid., 187.

[29] Arnold Larson, "Estimation of Hedging and Speculative Positions in Futures Markets," *Food Research Institute Studies,* **2,** No. 3 (November 1961).

cise measurement of the speculative commitment and its subsequent effects on price variability will have to wait for a more detailed publishing classification of open interest.

Because of these problems in measurement, the trader would expect difficulty in reaching a consensus regarding the impact of speculation on price behavior. In one study of the grains the following was concluded for soybeans:

> Clearly, this evidence does not support the hypothesis that "excessive speculation" causes or is even associated with market periods containing "unwarranted or undesirable price fluctuation." Of the 52 separate, semimonthly dates on which classification of total open interest indicated that the unneeded speculative fraction was high relative to hedging requirements, 39 cases were identified as markets in which prices showed little movement. However, in 36 out of the 40 cases for which the calculated Speculative Index was low, price behavior was entirely different. Prices in these particular markets moved over wide ranges, sometimes rising and falling rapidly during a relatively short period of time, and often showing wide daily price ranges over an extended period of time.[30]

A study of 186 monthly observations from 1950 to 1965 computed the hedging ratios and the Speculative Indexes for potatoes, cottonseed oil, soybean meal, corn, soybean oil, soybeans, rye, wheat, and oats.[31] Most of the hedging ratios (H_L/H_S) were near 0.5, which reflects a situation in which long hedging is not sufficient to cover short hedging requirements. All Speculative Indexes were greater than 1, ranging from 1.12 for oats to 1.31 for soybeans, leading to the conclusion that the market had a tendency toward imbalance, with speculation as the dominant force.

Because the futures markets are growing at such a pace, it seems reasonable to conclude that the markets of the future will require greater, not lesser, levels of speculation in order not only to survive but to thrive. The failure of some futures contracts can be traced directly to the failure of sufficient speculative activity, which in turn led to the unbalanced or lopsided markets discussed in Chapter 4. The behavior of futures prices is significantly affected by the levels of hedging and speculation in the markets, and it is safe to say that if no speculation marked the trading landscape, the hedging interests would have to create a statistical equivalent to the speculator at great cost.

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[30] *Margins, Speculation, and Price in Grain Futures Markets* (Washington, D.C.: Economic Research Service, USDA, 1967), p. 35.

[31] W. C. Labys and C. W. J. Granger, *Speculation, Hedging, and Commodity Price Forecasts* (Lexington, Mass.: D.C. Heath and Co., 1970), p. 127.

3 CHAPTER

The Mechanics of Futures Trading

"Mechanics, not microbes, are the menace to civilization."

—Norman Douglas

INTRODUCTION

Many people are reluctant to trade futures because they believe that the mechanics of trading are much more complicated than they really are. There are good reasons why some people should not trade futures, but the complexities of taking positions or understanding the bookkeeping are not among them. Some of the mystery is probably created by individual salespersons of brokerage firms who are loath to spend the time necessary to understand the technology themselves because of their greater interest in others of their firms' products.

Perhaps if a new futures trader preparing to make his or her first trade is followed, some confusion may be cleared away.

THE FIRM

Unless the new trader is actually a member of a commodity exchange, it will be necessary to deal directly or indirectly with a member brokerage firm. Most firms that handle public business are futures commission merchants (FCMs) registered as such with the CFTC. Such firms are called brokers, commission houses, or wire houses. FCMs are of two general types, but their methods of operation are similar.

One type of broker is the mixed wire or commission house, which normally emphasizes listed securities but has other departments dealing with over-the-counter securities, bonds, stock options, mutual funds, and futures. The other is the specialized broker, which deals exclusively in futures or even in a limited number of futures. Some of the latter were originally cash commodity firms that went into the futures business to add to their incomes. Many already had sufficient investment in memberships and wire facilities to make the addition of customer brokerage relatively inexpensive. A more recent addition is the introducing broker, which offers only limited service and trades in turn through a member firm.

Most clients who have traded in securities and become interested in futures find it convenient to begin their trading through the same broker through which they have traded securities if the broker is an integrated house. Many clients assume that large, well-known firms are strongly capitalized and that cash balances are therefore more secure. Others prefer the specialty firms because they believe that such firms provide more varied current information and better guidance. Still others trade through discount firms, which offer minimum service and minimum commissions. Such customers prefer to make their own decisions either because they believe they can outperform the professionals or because they believe that professional opinions are worthless.

After the firm has been chosen, the new trader must select the salesperson with whom to do business. This person may be a partner or a stockholder of the firm but more likely is an employee variously referred to as "associated person," "registered commodity representative" (RCR), "account executive," "investment executive," or some other euphemism for "salesperson." The salespeople frequently refer to themselves as "brokers," although the term "broker" really describes the firm which employs them. Most new customers spend little time or effort in their selection of this man or woman, which is probably an error. Trading may involve a significant portion of one's net worth, and the salespeople in many cases have a considerable impact on the results of trading in the accounts they handle.

In order to make a selection intelligently, the new customers should give some thought to the services expected from the RCR. If they wish to make their own decisions and do not wish to be solicited to make transactions, they may be primarily concerned with the service they expect. Such customers may be satisfied with relatively inexperienced but well-trained RCRs. Although such RCRs lack experience, they have considerable time and are grateful to have the few clients who deal with them. Therefore, the service rendered may be above average. A little time should be spent with the representative before trading begins to determine whether a good personal relationship is likely to develop. There is no need to trade with a salesperson simply because he or she happens to be the "broker of the day" or happens to be standing near the door when the customer happens to come in.

If the client is going to rely on the RCR to guide the trading in the account, the care given to the selection of the RCR is even more important. In addition to the ability to render good service, the RCR will need experience, good judgment, and integrity. These are not easy to evaluate, but neither are they impossible. One can choose one's broker as one would choose a lawyer, physician, dentist, or tax consultant—that is, by referral from others who have received satisfactory performance. A possible criterion is the RCR's personal trading. If results have been good, they may not necessarily be destined to continue to be good, but this is better than having to account for continuously poor results over a significant period. If RCRs do not trade their own accounts, one might wonder why. Presumably the RCR is economically motivated or would not be in the brokerage business. There may, of course, be mitigating circumstances, such as a rule of the firm precluding such trading or the judgment of the RCR that futures trading is not suitable for his or her financial situation or investment objective.

Some customers may wish to ask some questions about a firm's research department. It is not enough to know that there are some people in New York or Chicago who send out wires or prepare attractive-looking market letters and special reports. It is important to know that facts are separated from opinions and that the first are accurate and the latter useful.

OPENING THE ACCOUNT

Once the brokerage house and RCR have been selected, the opening of the individual brokerage account is a simple procedure. Various papers need to be signed, which will vary somewhat from broker to broker, but the following are typical.

The basic form is the customer's margin agreement, in which the client agrees to be responsible for any losses in trading, just as in a securities account. The form may be signed by an individual client or by more than one, in which case the clients must specify whether they wish to be joint tenants or tenants in common. If they choose to act as joint tenants with right of survivorship, the broker will accept instructions from all joint tenants. In the event of the death of any of them, the equity in the account belongs to the survivors. If the customers act as tenants in common, they own the account in specified shares. Typically, a husband and wife will be joint tenants, whereas unrelated customers, such as business partners, will open their accounts as tenants in common.

A risk disclosure statement is required by the CFTC of all futures commission merchants and introducing brokers that solicit futures or options business. These forms must be received, signed, and dated by new customers before trading begins. Their purpose is to attempt to make certain that new customers are aware of at least the basic risks present in futures or options trading. There are, of course, some risks not contained in the forms which should be clarified by the salespeople. Customers who choose not to read the forms or absorb their implications may still be bound by them, particularly if they sign an accompanying statement indicating that the forms were received and understood.

A form frequently requested is the authority to transfer funds. This form, formerly called the "CEA letter," was used for the transfer of funds between accounts used for regulated and unregulated futures. Since all futures are now regulated, the form is used primarily for routine transfers between futures and securities accounts owned by the same customer.

Futures may also be traded by partnerships or corporations. In a partnership all partners must agree to allow the account to be opened and must designate which partners can act for all. Corporate charters must allow futures trading, and the broker must be told which officers of the corporation are to be allowed to trade the account. Minors may be prohibited from trading by some brokers, but others permit accounts in the name of a minor if guaranteed by an adult.

Most brokers require that new accounts be financed with a minimum deposit such as $5000 or $10,000. Others require only the margin required by exchanges for a particular position, which may be only a few hundred dollars. Customers who deposit the bare minimums to cover only required initial margins should be aware of the regulations requiring prompt deposits of additional funds in the event of market adversity. Some brokerage firms allow more impairment than others, and there are varying opinions on what is meant by "prompt." Exchanges specify both minimum initial and maintenance margin levels, but many brokers have house rules that are more stringent than those of the exchanges. Although competition holds differences in bounds, many firms are concerned enough about client financial suitability to require deposits which are high enough to make certain that clients have at least enough money to absorb a minimum level of exposure to risk.

If orders in an account are to be placed by someone other than the client investing the capital, the broker will require a limited power of attorney, which is usually called a "trading authority." Such discretionary authority may be granted to the RCR, to a friend or relative of the customer, or to an account manager who will trade the account in return for compensation. A general power of attorney allows money to be withdrawn from the account in addition to granting authority to make trades. There is seldom any good reason to use this kind of document for trading purposes. Discretionary accounts are subject by some exchanges to minimum capital requirements that are somewhat greater than the minimum requirements for accounts not so managed. The client is usually responsible for all losses in the account, even in a discretionary account where the positions are ordered by someone else, so one should be cautious before signing a trading authority. This is especially true if the person who is to manage the account has any possible conflict of interest in the trading, such as generation of commissions. Those who wish to have their accounts managed or who wish to manage the accounts of others should take the time to note the latest exchange, state, and CFTC rules and regulations applicable to such accounts.

CONTRACT INFORMATION

The decision-making processes by which traders choose the futures in which to trade as well as the number of contracts and the particular contract month best for their purposes are discussed at length in subsequent chapters of this book, but a summary of basic information can be indicated at this point. The lists in Table 3-1 are not complete, but they do indicate the major futures exchanges in the United States, typical futures most actively traded on them, and pertinent contract data concerning them. From time to time changes occur in delivery months, opening times, closing times, and, of course, the list of futures itself. Most brokers will provide updated information, which they may designate as "contract specifications" or "contract information." There is no need for a customer, or even an RCR, to attempt to memorize much of this information. All that

TABLE 3-1

Contract Specifications

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
Belgium Futures and Options Exchange (BELFOX)					
BEL 20 index	1000 BEF × BEL 20 Index	Index points	0.10 index points = 100 BEF[*]	9:00–4:30	Yes
10-yr. Belgium gov't bond	2,500,000 BEF[*]	Points and hundreds	0.01 = 250 BEF	8:25–4:30	Yes
3-month BIBOR[†]	25,000,000 BEF	100 minus interest rate	0.01 = 625 BEF	8:25–4:30	No
Chicago Board of Trade (CBOT)					
Financial futures					
Dow Jones Industrial Average	$10 × index	Index points	1 pt. = $10	8:15–3:15	Yes
U.S Treasury 30-yr bond	$100,000	Points and 32nds	1/32 = $31.25	7:20–2:00 Project A[‡]	Yes
U.S. 10-yr note	$100,000	Points and 32nds	1/32 = $31.25	7:25–1:25 Project A	Yes
U.S. 5-yr note	$100,000	Points and 64ths	1/64 = $15.625	7:25–1:25 Project A	Yes
U.S. 2-yr note	$200,000	Points and quarters of 32nds	1/4 of 1/32 = $15.625	7:25–1:25 Project A	Yes
30-day fed funds rate	$5,000,000	100 minus fed funds rate	0.5 bp = $20.84(1) 1.0 bp = $41.67(2)	7:25–1:25 Project A	Yes
Municipal Bond Index	$1000 × index	Points and 32nds	1/32 = $31.25	7:25–1:25 Project A	Yes
Yield curve spread	$25,000 × (100+ yield of OTR issues)	Points and 8ths	1/8 = $31.25	7:25–1:25	Yes

[*] Belgium franc.

[†] Brussels Interbank offer rate.

[‡] Project A hours are 14:30–16:30 Monday to Thursday and 22:00–6:00 Sunday to Thursday.

TABLE 3-1

Contract Specifications (*Continued*)

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
Metals					
Kilo gold	32.15 troy oz	$0.01 per oz	$0.1/oz = 3.22	7:20–1:40	No
1000 oz. silver	1000 troy oz	$0.01 per oz	$0.1/oz = 1.00	7:25–1:25	Yes
5000 oz. silver	5000 troy oz	$0.01 per oz	$0.1/oz = 5.00	7:25–1:25 Project A	No
Commodities					
Corn	5000 bu	Cents/bu	1/4 cent = $12.50	9:30–1:15 Project A	Yes
Oats	5000 bu	Cents/bu	1/4 cent = $12.50	9:30–1:15 Project A	Yes
Rough rice	2000 cwt	Cents/cwt	1/2 cent = $10.00	9:30–1:15 Project A	Yes
Soybeans	5,000 bu	Cents/bu	1/4 cent = $12.50	9:30–1:15 Project A	Yes
Bean meal	100 tons	Cents/ton	10 cents = $10	9:30–1:15 Project A	Yes
Bean oil	60,000 lb	Cents/lb	0.01 cents = $6	9:30–1:15 Project A	Yes
Wheat	5000 bu	Cents/bu	1/4 cent = $12.50	9:30–1:15 Project A	Yes
Anhydrous ammonia	100 ton	Cents/ton	10 cents/ton = $10	9:05–12:20	No
Diammonium phosphate	100 ton	Cents/ton	10 cents/ton = $10	9:05–12:15 Project A	No

Chicago Mercantile Exchange (CME)					
Currencies					
Australian dollar	100,000 AD	U.S. dollars	$0.0001/AD = $10	7:20–2:00 Globex	Yes
Brazillian real	100,000 BR	U.S. dollars	$0.0001/BR = $10	7:20–2:00 Globex	Yes
British pound	62,500 BP	U.S. dollars	$0.0002/BP = $10	7:20–2:00 Globex	Yes
Canadian dollar	100,000 CD	U.S. dollars	$0.0001/CD = $10	7:20–2:00 Globex	Yes
Deutsche mark	125,000 DM	U.S. dollars	$0.0001/DM = $10	7:20–2:00 Globex	Yes
French franc	500,000 FF	U.S. dollars	$0.0002/FF = $10	7:20–2:00 Globex	Yes
Japanese yen	12,500,000 JY	U.S. dollars	$0.000001/JY = $10	7:20–2:00 Globex	Yes
Mexican peso	500,000 MP	U.S. dollars	$0.000025/MP = $12.50	7:20–2:00 Globex	Yes
Swiss franc	125,000 SF	U.S. dollars	$0.0001/SF = $10	7:20–2:00 Globex	Yes
British pound, rolling spot	250,000 BP	U.S. dollars	$0.0001/BP = $25	7:20–2:00 Globex	No
Deutsche mark, rolling spot	$250,000	DM	0.0001DM/$ = 25DM	7:20–2:00 Globex	No
Japanese yen, rolling spot	$250,000	JY	0.01JY/$ = 2500 JY	7:20–2:00 Globex	Yes
Financial futures					
3-mo eurodollar	$1,000,000	100 minus interest rate	0.01 point = $25	7:20–2:00 Globex	Yes

TABLE 3–1

Contract Specifications (*Continued*)

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
Fed funds	$3,000,000	100 minus mean of overnight fed funds	0.005 point = $12.50	7:20–2:00 Globex	Yes
Treasury bill (13 week)	$1,000,000	100 minus discount rate	0.01 point = $25	7:20–2:00 Globex	Yes
1-mo LIBOR	$3,000,000	Points and hundreds	0.01 point = $25	7:20–2:00 Globex	Yes
Index futures					
FT-SE 100	$50 × index	Index points	0.5 index point = $25	8:30–3:15 Globex	No
GSCI	$250 × index	Index points	0.10 index point = $25	8:30–3:15 Globex	Yes
Major Market Index	$500 × index	Index points	0.05 index point = $25	8:15–3:15 Globex	Yes
Nasdaq 100	$100 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
Nikkei 225	$5 × index	Index points	5 index points = $25	8:30–3:15 Globex	Yes
Russell 2000	$500 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
S&P 500	$250 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
S&P 500/Barra Growth Index	$500 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes

S&P 500/Barra Value Index	$500 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
S&P Midcap 400	$500 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
e-mini S&P 500	$50 × index	Index points	0.25 index point = $12.50	8:30–3:15 Globex	Yes
Commodity futures					
Feeder cattle	40,000 lbs	Cents/lb	0.025 cents/lb $10	9:05–1:00	Yes
Live cattle	40,000 lb	Cents/lb	0.025 cents/lb $10	9:05–1:00	Yes
Lean hog	40,000 lb	Cents/lb	0.025 cents/lb $10	9:10–1:00	Yes
Pork belly	40,000 lb	Cents/lb	0.025 cents/lb $10	9:10–1:00	Yes
Oriented standard board (OSB)	100,000 ft²	$/1,000 ft²	$0.10/1,000 ft = $10	9:00–1:05	Yes
Random length lumber	80,000 board ft	$/1,000 ft²	$0.10/1,000 ft = $8	9:00–1:05	Yes
COMEX (division of the New York Mercantile Exchange)					
Copper	25,000 lb	Cents/lb	0.05 cents/lb = $12.50	8:10–2:00 ACCESS	Yes
Gold	100 troy oz	$/oz	$0.10/oz = $10	8:20–2:00 ACCESS	Yes
Silver	5000 troy oz	Cents/oz	0.05 cents/oz = $25	8:25–2:25 ACCESS	Yes
Coffee, Sugar & Cocoa Exchange, Inc. (CSCE)					
Cocoa	10 metric ton	$/metric ton	$1/metric ton = $10	9:00–2:00	Yes
Coffee "C"	37,500 lb	Cents/lb	0.05 cents/lb = $3.75	9:15–1:35	Yes
Sugar #11 (world)	112,000 lb	Cents/lb	0.01 cents/lb = $11.20	9:30–1:20	Yes
Sugar #14 (domestic)	112,000 lb	cents/lb	0.01 cents/lb = $11.20	9:10–1:15	Yes

TABLE 3–1

Contract Specifications (*Continued*)

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
Fed funds	$3,000,000	100 minus mean of overnight fed funds	0.005 point = $12.50	7:20–2:00 Globex	Yes
Treasury bill (13 week)	$1,000,000	100 minus discount rate	0.01 point = $25	7:20–2:00 Globex	Yes
1-mo LIBOR	$3,000,000	Points and hundreds	0.01 point = $25	7:20–2:00 Globex	Yes
Index futures					
FT-SE 100	$50 × index	Index points	0.5 index point = $25	8:30–3:15 Globex	No
GSCI	$250 × index	Index points	0.10 index point = $25	8:30–3:15 Globex	Yes
Major Market Index	$500 × index	Index points	0.05 index point = $25	8:15–3:15 Globex	Yes
Nasdaq 100	$100 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
Nikkei 225	$5 × index	Index points	5 index points = $25	8:30–3:15 Globex	Yes
Russell 2000	$500 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
S&P 500	$250 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
S&P 500/Barra Growth Index	$500 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes

S&P 500/Barra Value Index	$500 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
S&P Midcap 400	$500 × index	Index points	0.05 index point = $25	8:30–3:15 Globex	Yes
e-mini S&P 500	$50 × index	Index points	0.25 index point = $12.50	8:30–3:15 Globex	Yes
Commodity futures					
Feeder cattle	40,000 lbs	Cents/lb	0.025 cents/lb $10	9:05–1:00	Yes
Live cattle	40,000 lb	Cents/lb	0.025 cents/lb $10	9:05–1:00	Yes
Lean hog	40,000 lb	Cents/lb	0.025 cents/lb $10	9:10–1:00	Yes
Pork belly	40,000 lb	Cents/lb	0.025 cents/lb $10	9:10–1:00	Yes
Oriented standard board (OSB)	100,000 ft²	$/1,000 ft²	$0.10/1,000 ft = $10	9:00–1:05	Yes
Random length lumber	80,000 board ft	$/1,000 ft²	$0.10/1,000 ft = $8	9:00–1:05	Yes
COMEX (division of the New York Mercantile Exchange)					
Copper	25,000 lb	Cents/lb	0.05 cents/lb = $12.50	8:10–2:00 ACCESS	Yes
Gold	100 troy oz	$/oz	$0.10/oz = $10	8:20–2:00 ACCESS	Yes
Silver	5000 troy oz	Cents/oz	0.05 cents/oz = $25	8:25–2:25 ACCESS	Yes
Coffee, Sugar & Cocoa Exchange, Inc. (CSCE)					
Cocoa	10 metric ton	$/metric ton	$1/metric ton = $10	9:00–2:00	Yes
Coffee "C"	37,500 lb	Cents/lb	0.05 cents/lb = $3.75	9:15–1:35	Yes
Sugar #11 (world)	112,000 lb	Cents/lb	0.01 cents/lb = $11.20	9:30–1:20	Yes
Sugar #14 (domestic)	112,000 lb	cents/lb	0.01 cents/lb = $11.20	9:10–1:15	Yes

TABLE 3-1

Contract Specifications (*Continued*)

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
Deutsche Terminborse (Germany) (DTB)					
10-yr long-term notional bond (Bund)	250,000 DM	Points and 1/100 of a point	0.01 point = 25 DM	8:00–5:30	Yes
5-yr medium-term notional bond (Bobl)	250,000 DM	Points and 1/100 of a point	0.01 point = 25 DM	8:00–5:30	Yes
DAX future	100 DM × DAX index	Index points	0.5 index point = 50 DM	9:00–5:00	Yes
MDAX future	10 DM × Midcap DAX index	Index points	0.5 index point = 5 DM	9:00–5:00	No
3-mo FIBOR	1,000,000 DM	100 minus interest rate	0.01% = 25 DM	8:45–5:15	No
Financial Instrument Exchange (division of the New York Cotton Exchange)					
US dollar index	$1000 × US Dollar Index	Index points	0.01 = $10	7:00 pm–10:00 pm[†] 3:00 am–8:00 am[‡] 8:05 am–3:00 pm	Yes
Mark–French franc Cross-rate	500,000 DM	FF/DM	0.0001 FF = 50 FF	7:00 pm–10:00 pm[†] 3:00 am–9:00 am[‡] 9:05 am–3:00 pm	Yes
Mark-lira cross-rate	250,000 DM	ITL/DM	0.05 ITL = 12,500 ITL	7:00 pm–10:00 pm[†] 3:00 am–9:00 am[‡] 9:05 am–3:00 pm	Yes
Mark-swiss franc cross-rate	125,000 DM rate futures contract	SFR/DM	0.0001 SFR = 12.50 SFR	7:00 pm–10:00 pm[†] 3:00 am–9:00 am[‡] 9:05 am–3:00 pm	Yes
Mark-yen cross-rate	125,000 DM	JY/DM	0.01 JY = 1250 JY	7:00 pm–10:00 pm[†] 3:00 am–9:00 am[‡] 9:05 am–3:00 pm	Yes

[†] EST; hours for EDST are 8:00 pm to 11:00 pm.

[‡] Traded on Dublin exchange floor (hours listed are EST).

Sterling-mark cross-rate	125,000 BP	DM/BP	0.0001 DM = 12.50 DM	7:00 pm–10:00 pm† 3:00 am–9:00 am‡ 9:05 am–3:00 pm	Yes
Pound–U.S. dollar cross-rate	125,000 BP	U.S./BP	0.0001 U.S./BP = $12.50	7:00 pm–10:00 pm† 3:00 am–8:00 am‡ 8:05 am–3:00 pm	No
U.S. dollar–mark cross-rate	200,000 US	DM/U.S.	0.0001 U.S./DM = 20DM	7:00 pm–10:00 pm† 3:00 am–8:00 am‡ 8:05 am–3:00 pm	No
U.S. dollar–Swiss franc cross-rate	200,000 US	SFR/U.S.	0.0001 U.S./SFR = 20SF	7:00 pm–10:00 pm† 3:00 am–8:00 am‡ 8:05 am–3:00 pm	No
U.S. dollar-yen cross-rate	200,000 US	JY/U.S.	0.01 U.S./JY = 2000JY	7:00 pm–10:00 pm† 3:00 am–8:00 am‡ 8:05 am–3:00 pm	No
2-yr U.S. T-note, Treasury auction	$500,000 of a 2-yr "when issued" note	100 minus treasury yield	0.005 pt. = $50	8:20–3:00	No
5-yr U.S. T-note, treasury auction	$250,000 of a 5-yr "when issued" note	100 minus treasury yield	0.005 pt. = $50	8:20–3:00	No
Hong Kong Futures Exchange Ltd.					
Hang Seng Index	50 HKD × index	Index points	1 index point = 50 HKD		Yes
Rolling Forex British pound	50,000 BP	U.S./BP	$0001/BP = $5	8:00–3:00†	No
Rolling Forex Deutche mark	50,000 U.S.	DM/U.S.	0.0001 DM/US = 5DM	8:00–3:00†	No
Rolling Forex yen	50,000 U.S.	JY/U.S.	0.01 JY/US = 500 JY	8:00–3:00†	No
Italian Derivatives Market of the Italian Stock Exchange (Italy) (IDEM)					
MIB 30 Index	10,000 ITL × index	Index points	5 index points = 50,000 ITL	9:30–5:30	

* EST; hours for EDST are 8:00 pm to 11:00 pm.

† 8:00–4:00 from early November to early April.

‡ Traded on Dublin exchange floor (hours listed are EST).

TABLE 3–1

Contract Specifications (*Continued*)

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
The International Petroleum Exchange (England) (IPE)					
Brent crude oil	1000 bbl = 42,000 US gal	U.S. $ and ¢/bbl	1 ¢/bbl = 10 U.S.	10:02–8:15	Yes
Gas oil	100 metric tonne	U.S. $ and ¢/metric tonne	25 ¢/metric tonne = 25 US	9:15–5:27	Yes
Kansas City Board of Trade (KCBT)					
Western natural gas	10,000 MMbtu	$, c, & 1/10¢/MMbtu	1/10 ¢/MMBtu = $10	8:30–2:30	Yes
Value line	$500 × index	Index points	0.05 index point = $25	8:30–3:15	No
Mini value line	$100 × index	Index points	0.05 index point = $25	8:30–3:15	Yes
Wheat, #2 hard red winter	5,000 bu	$, c, & 1/4¢/bu	1/4 cbu = $12.50	9:30–1:15	Yes
*London International Financial Futures and Options Exchange (LIFFE) (England)**					
Interest rate futures					
3-mo ECU	1,000,000 ECU	100 minus interest rate	0.01 pt. = 25 ECU	8:05–4:05	No
3-mo eurolira	1,000,000,000 ITL	100 minus interest rate	0.01 pt. = 25,000 ITL	7:55–4:10	Yes
3-mo euromark	1,000,000 DM	100 minus interest rate	0.01 pt. = 25 DM	8:00–4:10	Yes
3-mo euroswiss	1,000,000 SF	100 minus interest rate	0.01 pt. = 25 SF	8:10–4:05	Yes
3-mo sterling	500,000 BP	100 minus interest rate	0.01 pt. = 12.50 BP	8:05–4:05	Yes
10-yr German long term govt bond (Bund)	250,000 DM	Points & hundredths of a point	0.01 pt. = 25 DM	7:30–4:15	Yes
10-yr Italian govt. bond (BTP)	200,000,000 ITL	Points & hundredths of a point	0.01 point = 20,000 ITL	8:00–4:10	Yes
10-yr Japanese govt. bond (JGB)	1,000,000,000 JY	Points & hundredths of a point	0.01 point = 10,000 JY	7:00–4:00	No
15-yr Long Gilt	50,000 BP	Points & 32ds of a point	1/32 point = 15.625 BP	8:00–4:15	Yes

* ATP (automated pit trading) is LIFFE's electronic trading system.

Index futures					
FT-SE 100	25 BP × FT-SE 100 Index	Index points	0.5 index point = 12.50 BP	8:35–4:10	Yes
FT-SE Mid 250	10 BP × FT-SE Mid 250 Index	Index points	0.5 index point = 5.00 BP	8:30–4:05	No
Commodity futures					
Barley	100 tonne	Pounds sterling & pence/tonne	0.05 BP/tonne = 5 BP	10:30–12:30 2:30–4:15	No
Cocoa	10 tonne	Pounds sterling/ton	1 BP/tonne = 10 BP	9:30–12:28 2:00–4:45	Yes
Robusta coffee	5 tonne	US$/tonne	US $/tonne	9:45–12:32 2:15–5:00	Yes
Potato	20 tonnes	Pounds sterling & pence/tonne	0.10 BP/tonne = 2 BP	11:00–12:30 2:30–4:00	No
#5 white sugar	50 tonne	U.S.$ & ¢/tonne	10 ¢/tonne = 5 U.S.	10:00–6:30	Yes
Wheat	100 tonne	Pounds sterling & pence/ton	0.05 BP/tonne = 5 BP	10:30–12:30 2:30–4:15	Yes
BIFFEX—Baltic Freight Index	$10 × index	Index points	1 index point = 10 US	10:15–12:30 2:30–4:30	No
London Metal Exchange (LME) (England)					
Aluminum alloy*	20 tonne	U.S. $/tonne	50¢/tonne = $10 US	24 hours**	Yes
Primary aluminum*	25 tonnes	U.S. $/tonne	50¢/tonne = $12.50 US	24 hours**	Yes
Copper*	25 tonne	U.S. $/tonne	50¢/ton = $12.50 US	24 hours**	Yes
Lead*	25 tonne	U.S. $/tonne	50¢/ton = $12.50 US	24 hours**	Yes
Nickel*	6 tonne	U.S. $/tonne	$1.00/tonne = $6 US	24 hours**	Yes
Tin*	5 tonne	U.S. $/tonne	$1.00/tonne = $5 US	24 hours**	Yes
Zinc*	25 tonne	U.S. $/tonne	50¢/tonne = $12.50 US	24 hours**	Yes

* Trading months.
† Trading hours.

TABLE 3-1

Contract Specifications (*Continued*)

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
Marche a Terme International de France (MATIF) (France)					
3-mo PIBOR	5,000,000 FF	100 minus interest rate	0.01 point = 125 FF	8:30 am–4:00 pm GLOBEX	Yes
CAC 40 Index	200 FF × CAC 40 Index	Index points	0.5 index point = 100 FF	10:00 am–5:00 pm GLOBEX	No
ECU bond	100,000 ECU	Points & 1/100th of a point	0.02 point = 20 ECU	9:00 am–4:30 pm GLOBEX	No
10-yr notional bond	500,000 FF	Points & 1/100th of a point	0.02 point = 100 FF	9:00 am–4:30 pm GLOBEX	Yes
Meff Renta Fija (MEFF) (Spain)					
10-yr notional Spanish government bond	10,000,000 Ptas	Points & 1/100th of a point	.01 pt. = 1,000 Ptas	9:00–5:15	Yes
3-yr notional Spanish government bond	10,000,000 Ptas	Points & 1/100th of a point	.01 pt. = 1,000 Ptas	9:00–5:15	Yes
90-day MIBOR Plus	100,000,000 Ptas	100 minus interest rate	.01 pt. = 2500 Ptas	9:00–5:15	Yes
360-day MIBOR Plus	100,000,000 Ptas	100 minus interest rate	.01 pt. = 10,000 Ptas	9:00–5:15	No
IBEX 35	100 Ptas X IBEX 35 Index	Index points	1 index pt. = 100 Ptas	10:30–5:15	Yes
MidAmerica Commodity Exchange (MIDAM)					
Corn	1000 bu	¢/bu	1/8¢/bu = $1.25	9:30–1:45	Yes
Oats	1000 bu	¢/bu	1/8¢/bu = $1.25	9:30–1:45	No
Soybeans	1000 bu	¢/bu	1/8¢/bu = $1.25	9:30–1:45	Yes
Wheat	1000 bu	¢/bu	1/8¢/bu = $1.25	9:30–1:45	Yes
Cattle	20,000 lb	¢/lb	$0.00025/lb = $5	9:05–1:15	No
Hogs	20,000 lb	¢/lb	$0.00025/lb = $5	9:10–1:15	No

Metal futures					
Gold, New York	33.2 fine troy oz	¢/troy oz	10¢/oz = $3.32	7:20–1:40	Yes
Platinum	25 troy oz	¢/troy oz	10¢/oz = $2.50	7:20–1:40	No
Silver, New York	1,000 troy oz	¢/troy oz	10/100¢/oz = $1.00	7:25–1:40	No
Currency futures					
British pound	12,500 BP	$/BP	$0.0002/BP = $2.50	7:20–2:15	No
Canadian dollar	50,000 BP	$/CD	$0.0001/CD = $5.00	7:20–2:15	No
Deutche mark	62,500 DM	$/DM	$0.0001/DM = $6.25	7:20–2:15	No
Japanese yen	6,250,000 JY	$/JY	$0.000001/JY = $6.25	7:20–2:15	No
Swiss franc	62,500 SF	$/SF	$0.0001/SF = $6.25	7:20–2:15	No
Financial futures					
3-mo Eurodollar	$500,000	100 minus interest rate	0.01 point = $12.50	7:20–2:15	No
U.S. T-bond	$50,000	Points & 32nds of a point	1/32 point = $15.62	7:20–3:15	Yes
10-yr U.S. T-note	$50,000	Points & 32nds of a point	1/32 point = $15.62	7:20–3:15	No
Minneapolis Grain Exchange (MGE)					
Hard red Spring wheat	5000 bu*	$ & ¢/bu	1/4¢/bu = $12.50	9:30–1:15	Yes
Soft white wheat	5000 bu	$ & ¢/bu	1/4¢/bu = $12.50	9:30–1:15	Yes
Mercato Italiano Futures (MIF) (Italy)					
10-yr Italian government bond (BTP)	250,000,000 ITL	Points & 1/100th of a pt.	0.01 point = 25,000 ITL	9:00 am–5:00 pm 5:10 pm–7:00 pm	Yes
5-yr Italian government bond (BTP)	250,000,000 ITL	Points & 1/100th of a pt.	0.01 point = 25,000 ITL	9:00 am–5:00 pm 5:10 pm–7:00 pm	No
The Montreal Exchange (Canada)					
3-mo Canadian Banker Acceptance (BAX)	1,000,000 CD	100 minus interest rate	0.01% = 25 CD	8:00–3:00	Yes

* Job lots of 1000 bu allowed.

TABLE 3-1

Contract Specifications (*Continued*)

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
10-yr Government of Canada bond (CGB)	100,000 CD	Points & 1/100th of a pt.	0.01 point = 10 CD	8:20–3:00	No
5-yr Government of Canada bond (CGF)	100,000 CD	Points & 1/100th of a pt.	.01 point = 10 CD	8:20–3:00	No
New York Cotton Exchange (NYCE)					
Cotton	50,000 lb	¢/lb	0.01¢/lb = \$5 (<95¢/lb) 0.05 ¢/lb = \$25 (≥95¢/lb)	10:30–2:40	Yes
Frozen concentrated orange juice	15,000 lb	¢/lb	0.05 ¢/lb = \$7.50	10:15–2:15	Yes
New York Futures Exchange (NYFE)					
CRB Index	\$500 × CRB Index	Index points	0.05 point = \$25	9:40–2:45	Yes
NYSE Composite Index	\$500 × NYSE Composite Index	Index points	0.05 point = \$25	9:30–4:15	Yes
NYMEX					
Crude oil	1,000 U.S. bbl	\$ and ¢/bbl	\$0.01/bbl = \$10	9:45–3:10	Yes
Electricity	736 mwh	\$ and ¢/mwh	\$0.01/mwh = \$7.36	9:45–3:10	Yes
Gasoline, Gulf Coast, unleaded	42,000 U.S. gal	\$ and ¢/gal	\$0.0001/gal = \$4.20	9:45–3:10	No
Gasoline, New York, unleaded	42,000 U.S. gal	\$ and ¢/gal	\$0.0001/gal = \$4.20	9:45–3:10	Yes
Gasoline/crude oil Crack spread option	1 long gasoline and 1 short crude futures contract	\$ and ¢/bbl	\$0.01/bbl = \$10	9:50–3:10	N/A
Heating oil	42,000 U.S. gal	\$ and ¢/gal	\$0.0001/gal = \$4.20	9:50–3:10	Yes

Heating oil/crude oil Crack spread option	1 long heating oil and 1 short crude futures contract	$ and ¢/bbl	$0.01/bbl. = $10	9:50–3:10	N/A
Natural gas	10,000 MMbtu	$ and ¢/bbl	$0.001/MMbtu = $10	10:00–3:10	Yes
Palladium	100 troy oz	$ and ¢/bbl	$0.05/oz = $5	8:10–2:20	No
Platinum	50 troy oz	$ and ¢/bbl	$0.10/oz = $5	8:10–2:30	Yes
Propane	42,000 U.S. gal	$ and ¢/gal	$0.0001/gal = $4.20	9:55–3:00	No
Osaka Securities Exchange (Japan)					
Nikkei 225 Stock Index	1,000 JY × Nikkei 225 Stock Index	Index points	10 index points = 10,000 JY	9:00–11:00 12:30–3:00	Yes
Nikkei 300 Stock Index	10,000 JY × Nikkei 300 Stock Index	Index points	0.1 index points = 1,000 JY	9:00–11:00 12:30–3:15	Yes
Philadelphia Board of Trade (PBOT)					
Australian dollar	100,000 AD	¢/AD	$0.0001/AD = $10.00	2:30 am–2:30 pm	
British pound	62,500 BP	¢/BP	$0.0001/BP = $6.25	2:30 am–2:30 pm	
Deutche mark	125,000 DM	¢/DM	$0.0001/DM = $12.50	2:30 am–2:30 pm	
French franc	500,000 FF	1/10/FF	$0.00002/FF = $10.00	2:30 am–2:30 pm	
Japanese yen	12,500,000 JY	1/100/JY	$0.000001/JY = $12.50	2:30 am–2:30 pm	
Swiss franc	125,000 SF	¢/SF	$0.0001/SF = $12.50	2:30 am–2:30 pm	
Philadelphia Stock Exchange (PHLX)					
Australian dollar option	50,000 AD	¢/AD	$0.0001/AD = $5.00	2:30 am–2:30 pm	N/A
British pound option	31,250 BP	¢/BP	$0.0001/BP = $3.125	2:30 am–2:30 pm	N/A
Canadian dollar option	50,000 CD	¢/CD	$0.0001/CD = $5.00	7:00 am–2:30 pm	N/A
Deutche mark option	62,500 DM	¢/DM	$0.0001/DM = $6.25	2:30 am–2:30 pm	N/A
French franc option	250,000 FF	1/10/FF	$0.00002/FF = $5.00	2:30 am–2:30 pm	N/A
Japanese yen option	6,250,000 JY	1/100/JY	$0.000001/JY = $6.25	2:30 am–2:30 pm	N/A
Swiss franc option	62,500 SF	¢/SF	$0.0001/SF = $6.25	2:30 am–2:30 pm	N/A

TABLE 3-1

Contract Specifications (*Continued*)

Commodity	Contract Size	Price Quoted in	Minimum Fluctuation	Trading Hours (Local)	Options Available?
BP/DM cross option	31,250 BP	DM/BP	0.0002DM/BP = 6.25DM	2:30 am–2:30 pm	N/A
DM/JY cross option	62,500 DM	JY/DM	0.01 JY/DM = 625 JY	2:30 am–2:30 pm	N/A
Sydney Futures Exchange (Australia) SFE					
90-day bank accepted bill	1,000,000 AD	100 minus annual percentage yield	0.01% = varying AD	8:30–12:30 2:00–4:30*	Yes
10-yr commonwealth treasury bond	100,000 AD	100 minus annual percentage yield	0.005% = varying AD	8:30–12:30 2:00–4:30*	Yes
3-yr commonwealth treasury bond	100,000 AD	100 minus annual percentage yield	0.01% = varying AD	8:30–12:30 2:00–4:30	Yes
All Ordinaries Share Price Index	25 AD × All Ordinaries Share Price Index	Index points	1 index point = 25 AD	9:50–12:30 2:00–4:10*	Yes
Greasy wool	2500 kg	AD¢/kg	0.01 AD/kg = 25 AD	10:30–12:30 2:00–4:00*	No
Singapore International Monetary Exchange (SIMEX) (Singapore)					
Deffered spot US$/DM	100,000 U.S.	DM/U.S.	0.0001 DM/US$ = 10 DM	8:05 am–7:05 pm 7:35 pm–1:00 am†	No
Deffered spot US$/JY	100,000 U.S.	JY/US	0.01 JY/US$ = 1,000 JY	8:00 am–7:00 pm 7:35 pm–1:00 am†	No
3-mo eurodollar	1,000,000 U.S.	100 minus interest rate	0.01 point = 25 US	7:45 am–7:00 pm	Yes

* Also trades on SYSCOM.

† Electronic trading hours.

3-mo euroyen	100,000,000 JY	100 minus interest rate	0.01 point = 2,500 JY	7:58 am–11:15 am 12:15 pm–7:05 pm 7:35 pm–1:00 am† 9:20 pm–4:00 am‡	Yes
10-yr Japanese government bond (JGB)	50,000,000 JY	Points & 1/100th of a p	0.01 point = 5,000 JY	7:45 am–10:30 am 11:30 am–7:10 pm 7:45 am–10:30 am 7:35 pm–1:00 am†	Yes
Nikkei 225 stock average	500 JY × Nikkei 225 stock average	Index points	5 index points = 2,500 JY	7:55 am–10:15 am 11:15 am–2:15 pm	Yes
Nikkei 300 stock average	10,000 JY × Nikkei stock average	Index points	0.1 point = 1,000 JY	8:00 am–10:15 am 11:15 am–2:15 pm	Yes
Brent crude oil	1,000 bbl	$/bbl	US $0.01/bbl = $10	9:25 am–12:30 pm 2:30 pm–5:58 pm*	No
Tokyo International Financial Futures Exchange (TIFFE) (Japan)					
3-mo euroyen	100,000,000 JY	100 minus interest rate	0.01 point = 2,500 JY	9:00–12:00 1:30–3:30	Yes
1-yr euroyen	100,000,000 JY	100 minus interest rate	0.01 point = 2,500 JY	9:00–12:00 1:30–3:30	No
US dollar—Japanese yen currency	50,000 US	JY/US	0.05JY/US = 2,500 JY	9:00–12:00 1:30–3:30	No
Tokyo Stock Exchange (Japan) TSE					
10-yr Japanese government bond (JGB)	100,000,000 JY	Points & 1/100th of a pt.	0.01 point = 10,000 JY	9:00–11:00 12:30–3:00	Yes
20-yr Japanese government bond (JGB)	100,000,000 JY	Points & 1/100th of a pt.	0.01 point = 10,000 JY	9:00–11:00 12:30–3:00	No

‡ MOS trading hours.

† Electronic trading hours.

* 2:30 pm–4:58 pm during British summer time.

TABLE 3–1

Contract Specifications (*Continued*)

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
Tokyo Stock Price Index (TOPIX)	10,000 JY × TOPIX	Index points	0.5 index point = 5,000 JY	9:00–11:00 12:30–3:10	Yes
US T-bond	100,000 US	Points and 32ds of a	1/32 point = 31.25 U.S.	9:00–11:00 12:30–3:00	No
Winnipeg Commodity Exchange (Canada)					
Canola	100 metric ton*	CD/metric ton	0.10 CD/ton = 10 CD	9:30–1:15	Yes
Feed peas	100 metric ton*	CD/metric ton	0.10 CD/ton = 10 CD	9:30–1:20	No
Flaxseed	100 metric ton*	CD/metric ton	0.10 CD/ton = 10 CD	9:30–1:15	No
Oats	100 metric ton*	CD/metric ton	0.10 CD/ton = 10 CD	9:30–1:15	No
Wheat	100 metric ton*	CD/metric ton	0.10 CD/ton = 10 CD	9:30–1:15	No

* Job lots of 20 metric ton are allowed.

needs to be done is to obtain a current copy of such contract information and keep pertinent information for those futures in which one is currently interested.

Numerous sources provide futures quote information. Traders can receive delayed quotes either from the Internet or from delayed quote vendors, who charge from $50 to $200 per month for such services. Real-time quotes are more expensive because the trader is responsible for paying monthly exchange fees, which add $400 to $600 per month in additional cost (depending on the exchanges chosen). In addition to quotes, traders usually require analysis software to display and manipulate the data. Third parties such as Omega Research, Inc. (makers of Tradestation and SuperCharts) sell software for such purposes. Refer to Chapter 17 for a list of software vendors that service the needs of futures traders.

DAILY TRADING LIMITS

To prevent extreme price changes in one day, most exchanges limit the amount that many futures prices are allowed to move daily. This "daily limit" restricts the amount that a price may move above or below the settlement price of the previous trading day. For example, in cattle the daily limit is 1½ cents per pound. If cattle closed at 66.20 cents per pound on one day, then 67.70 cents would be "limit up" and 64.70 cents "limit down" on the next trading day. It might be noted that the range on the second day could be as much as 3 cents per pound because trading could be from limit up to limit down or limit down to limit up.

Despite widespread misconception on this point, a market does not close because a daily price limit is reached; it merely cannot trade past that point. Any amount of trading can take place at the limit if a trader is willing to take the opposite side, or, of course, a price can move down from limit up or up from limit down. Restrictions on limits can be modified by allowing wider moves after a move extended over a series of trading days. Sometimes limits are removed in the spot month or on the last day during which a given contract will be traded.

Many traders are overly concerned about the possibility of being locked into a position by an adverse limit move in those futures markets which provide for such limits. Although this is not a pleasant experience, it should be realized that the trader's real problem was caused by being wrong about the direction of price and not by the limit move. A limit move is designed to allow the market to have a cooling-off period and thereby encourage a smaller move than would otherwise have occurred. The alternative to a limit move is an *unlimited* move, which may provide far less comfort.

For those caught by an adverse limit move who cannot bear the thought of waiting for the next day's opening, it is often possible to acquire some degree of protection by spreading in the same market or in another market, such as a foreign one. It is even possible to liquidate the position altogether in some markets by acquiring a position in the spot market, which frequently has no price limits, opposite the unfortunate frozen position and then eliminating them both by a process frequently called a "switch." This process, of course, involves a cost.

TAKING A POSITION

When the account has been opened, the customer can take a position in one or more of the approximately 80 futures traded. The procedure, so far as the customer is concerned, is almost exactly like trading a security. An order is given to the RCR, who transmits it to the trading floor of the exchange upon which the selected future is traded. The transmission is usually done by private wire, but many firms use a telephone "hot line" to handle large orders or under conditions where time is short. It may be that an order is to be done on the opening or closing of a market, or an order may have a price limit close to the price at which the market is trading, and it is feared that the price of the market may move away if there is any delay.

When a trade is made, a report is sent back to the RCR, again either by private wire or by telephone. In the latter case, a report is also sent by wire to provide "hard copy" for the record. Orders are time-stamped when received, when transmitted, and when acted upon to assure the customer that instructions were followed promptly. Orders may be placed by customers personally, by letter, wire, or telephone. Most of them are placed by telephone.

The broker is required to mail the customer a confirmation of the trade as promptly as possible. This is usually done on the same day the trade is made. A confirmation of a new position indicates the exchange on which it was taken, the date, the price, and the size of the position. The confirmation of a position being liquidated contains the same information but in addition indicates the amount of profit or loss on the transaction and the total commission charged for entering and liquidating the position. This differs somewhat from a security confirmation of a closing transaction. Such confirmations do not indicate the profit or loss because the broker may not have access to this information. A stock can be bought at one brokerage house, held for years, and then sold at another. Futures positions are typically held for relatively brief periods and may not be readily transferred from one brokerage house to another.

LIQUIDATING A POSITION

A speculator who has established a long position may liquidate it in one of two ways. It may be offset with a sale, or the contract can be held until expiration. In the latter case there would be an actual delivery in the case of most futures or a cash settlement in lieu of delivery in the case of the others. One who has a short position has basically the same possible routes to follow: the short position can be offset with a purchase, or, for most futures, delivery can be made if the trader has it in deliverable form and location or can acquire it. For those futures which provide for it, settlement at maturity must be made in cash. For virtually all speculators offset is the liquidation route chosen. Most do not want the cash commodity or do not have it available for delivery. Their purpose in being in the markets is to attempt to take advantage of price change, not to deal in cash products.

If delivery is to become a factor, it is usually of more concern to the speculator with a long position than to one with a short position because it is the latter who has the choice of whether to make delivery and when. Sometimes the holder of a long position holds the position into the delivery month, hoping that the amount of deliverable cash product is too small or too tightly held to make the risk of receipt of any great concern. In such a case the holder should become familiar with the rules of the exchange on which he or she is trading to appraise the odds of receiving early deliveries if any are made. Notices of delivery are posted on dates and at times specified by exchange rules. These notices are sometimes given to the long with the oldest position in terms of the date on which it was established and sometimes to the brokerage house with the oldest net long position. The latter might well mean that a trader with a long position held with a brokerage house which itself was net short could not get delivery at all. Considering the cost and trouble that an unwanted delivery can cause, a trader who is not highly sophisticated in futures market operations might do well to liquidate long positions routinely before the first date that notice of delivery is possible. These dates are available from any well-informed brokerage firm.

The trader who does choose to hold a position into a delivery month must also be aware of the last day of futures trading after which offset is impossible and delivery and cash settlement are the only routes open. Current rules covering notice days and the last days of trading for all futures are readily available from brokerage houses. Some exchanges and brokerage houses increase margins, often substantially, on the first notice day because of the risks of delivery and increasingly erratic markets as the open interest becomes thin.

TYPES OF ORDERS

A future may be bought or sold at the market, which means that the floor broker on the exchange must execute the order promptly at the most favorable price possible.

A limit may be imposed by the customer, which precludes the floor broker from paying more on a buy order or selling for less on a sell order. This limit assures the trader that he will get at least the price he wants if the order is executed, but means that he will run the risk of not getting the order executed at all if the floor broker finds it impossible to fill it at the specified limit. Unlike the trader of listed security round lots, the futures trader who sees the correct price of a future "sell through his limit" on the tape, board, or quote machine cannot assume that his order has been filled. Because there are no floor specialists on the futures exchanges, it is possible and often reasonable for a transaction to take place too far away from a floor broker to allow him to complete it. This is not considered "missing the market" unless there is some evidence of carelessness.

Stop orders are often confused with limit orders but are actually quite different. A "buy stop" instructs a broker to execute an order when the price of a future rises to a specified level above the current market. The difference between a buy limit order and a buy stop order is exemplified as follows. A customer is inclined to buy December sugar, which is then selling at a price of 5.43 cents per pound. She tells her broker to buy her a contract at a price not to exceed 5.35 cents. This is a "buy limit." Another customer under the same circumstances tells her broker to buy a contract of December sugar but not until the price rises to at least 5.55 cents, at which point the order will be executed at the market. The buy limit order is usually placed below the current market and must be executed at the limit or better. The buy stop order is placed above the current market and may be executed at the price specified on the stop, above it, or below it, because it is executed at the market after the stop price is touched, at which point the stop is said to be "elected."

A "sell stop" instructs a broker to execute an order when the price falls to a given level, at which point it is to be executed at the market. Unlike a typical sell limit order, it is below the current market level and may be executed at a price at, above, or below the specified stop when it is elected.

A sell limit order may be used to establish a new position or to liquidate an old one. A buy limit may be used to establish a new long position or to liquidate an old short.

A stop order may be used to limit a loss, protect a profit, or establish a new position. In the first case a client may have bought his sugar at 5.45 cents per pound and have instructed his broker to sell it if it falls to 5.37 cents in order to limit his loss to eight points. In the second case the sugar may already have risen from 5.45 to 5.65 cents and the customer places his sell stop at 5.53 cents because he wants to keep his position if the price continues to rise but does not want to lose back all his paper profit if the price declines. Some clients will raise their stops as the price advances in an effort to gain as much as possible from a major move, while making certain that they can probably lose back only a little of the gain. This device, frequently called a "trailing stop," has great appeal to new traders but works considerably better in theory than in practice for reasons discussed in Chapter 4. Many major price moves seem to have an uncanny tendency to elect all the trailing stops just before going into their accelerating phase. In the third case a client with no position believes that if the current price declines from 5.45 to 5.36 cents, it will continue to decline substantially, and the client would like to take a short position, although not until it declines to that point. She thereupon tells her broker to sell her contract of sugar at 5.36 cents stop. Buy stops are used for similar reasons; that is, to limit a loss, protect a profit on a short position, or establish a new long position but only after the price begins to rise.

A somewhat more complex order is the stop limit. The client might instruct his broker not to buy sugar until it rises to 5.53 cents per pound and not to pay more than 5.55 cents. This is unlike the unlimited stop, which becomes a market order when the stop price has been touched. The limit price may be the same as or different from the specified stop.

A "market-if-touched (M.I.T.) order" is used somewhat like a limit order but with a minor difference. The limit order must be executed at the limit price or one more favorable to the client. The M.I.T. order is executed at the market when the market has traded at the price specified on the order, and so it may be filled at that price, above it, or below it. This order is often used by chartists who believe that a particular price is at the extreme of a trading range and who want to take a position immediately if that price level is reached with no risk of missing the market. M.I.T. orders are sometimes called "board orders." For example, a client long on pork bellies at 45.60 cents per pound who preferred to take his profit on a limit order might say, "Sell my July pork bellies at 48.50 cents." This instructs the brokerage firm to sell the contract at 48.50 cents or more. The order may be entered for one day or a specified period, or it may be open (good until canceled). Another client with a similar position who preferred M.I.T. orders would instruct her broker to sell her position at the market whenever a transaction took place at 48.50 cents or higher.

Sometimes a customer may wish to take a position within a short time but would like the broker on the floor of the exchange to use some of his personal judgment in the timing of the fill. The broker will do this if the order indicates that he is to fill it at the market but is to take his time and will not be responsible if by waiting too long or not waiting long enough the price is unsatisfactory to the customer. Such orders are marked "Take your time" (T.Y.T.), "Not held," or both. Customers may also specify the time at which they wish their orders filled; that is "on opening," "on close," or at a particular specified time.

"Alternative orders" provide for one of two possible executions: a customer may order 5000 bushels of corn at $2.45 a bushel and 5000 bushels of wheat at $3.56 a bushel but not want both. A far more common example of the alternative order is the placing of an objective and a stop, with instructions to cancel one if the other is filled. For example, having bought one contract of soybean oil at 24.50 cents a pound, a customer may order her broker to sell the oil at either 24.95 or 24.25 cents stop, whichever occurs first, and then immediately cancel the remainder of the order to avoid inadvertently reversing her position. This second kind of alternative order is popular with the trader who has carefully determined her objective and maximum loss point for a position and prefers to enter the order rather than watch the market and have to hurry to place one order or another as the market approaches one of the two points. Such an order also helps overcome the temptation to overstay positions.

"Scale orders" are used to establish or liquidate positions as the market moves up or down. The sugar trader may instruct his broker to buy a contract of sugar at 5.45 cents and another contract each time the price drops five points from that level until he has accumulated six contracts. When he sells out his position, he may order the broker to sell one contract at 5.70 cents and another contract each time the price rises five points until his six contracts have been sold.

"Contingent orders" are filled by the broker after the price of another contract or even another future reaches a specified level; for example, "Sell one July pork bellies at the market when August bellies have sold at 72.60." This order is used when the customer believes that August bellies will set the tone of the market but that profits will be maximized in the July contract.

"Spreads" may be established at a fixed difference rather than at specified prices because the spreader is concerned only with the difference rather than the level. She may therefore order her broker to "buy one July pork bellies and sell one February bellies at 180 points difference or more, premium February." Such an order could be used to establish a new spread position, which the trader believes will narrow, or to take the profit in a position at a narrower difference and be satisfied with the profit at 180 points difference.

DAILY OPERATING STATEMENT

It is essential that a trader be completely aware at all times of the status of his account. He must realize that it is the equity that is most important, not the closed profits and losses to date. Failure to accept this allows the trader to convince himself that he is ahead when he has taken some small profits but is keeping positions with large open losses in the hope that the markets will reverse and his losses will be recovered.

To avoid overextending an account the trader should distinguish his gross power from his net power. "Gross power" is the capital (credit balance or ledger credit) in a futures account increased or decreased by adjustments from all trades open at a particular time. The adjustments consist of margin requirements, commissions, and open profits or losses. Gross power can be used to margin new positions or can be withdrawn from the account. It is sometimes called "buying power" or "free credit."

"Net power" is gross power adjusted by the risk in open trades. This risk may be measured by the loss that would be suffered if all trades open were stopped out.

A trader, for example, has an account with $5000 and no open positions. For the moment, $5000 is her gross power. Let us assume that she has bought two contracts of cotton at 61.25 cents a pound, which require a margin of $900 per contract or $1800 for the entire position. The commission expense for the transaction is $90. Her gross power is therefore reduced to $3110. If cotton moves up 20 points a contract to 61.45 cents, the open profit of $200 can be added to gross power, which would then be $3310. As far as the broker is concerned, this amount can be used for new positions or withdrawn from the account. If a stop loss order has been entered at 60.80 cents, it is possible for each cotton contract to drop at least 65 points before it is sold. If the drop occurs, the value of the account will decline by $650. A cautious trader, therefore, would regard only $2660 as really available for use. This is her net power.

Traders use different devices to make certain that they are always aware of their equity. Some go to the length of withdrawing each day any excess created by improvement in their equity and depositing a check for the amount of the equity loss at the end of any day during which they suffer adversity. This makes them constantly aware that they are dealing in real money and not merely debits and credits.

A somewhat simpler method—one calculated to make the trader more popular with his broker—is to maintain a simple ledger sheet (see Exhibit 3-1). If the fluctuations in an account are alarmingly large, or if the trader is overextended, this statement will make the danger clear before, rather than after, a margin call or sell-out notice is received.

BUYING POWER

Sometimes a client may wish to know how much is available for new trades or how much cash can be withdrawn from his account. This amount is called "buying power," "excess," "excess margin," or "gross power," and in either case it would be the same at any given moment. To arrive at the figure it is necessary to subtract margin requirements on open positions from the equity in the account. This is just a way of saying that what is not being used is free to be utilized or withdrawn. The figure is computed by taking the credit balance, adjusting it by the open profit or loss, including commissions, on open positions to arrive at equity, and then subtracting margin requirements to arrive at the buying power or free balance. A well-run brokerage firm should be able to provide its clients with their buying power, equity, and open profit or loss almost immediately on request.

THE MONTHLY STATEMENT

The monthly statement sent by the broker to the customer lists the changes that took place in the account during the month. Such changes may result from the deposit or withdrawal of funds, the establishment or liquidation of positions, or the changes in the prices of futures positions held during the month and still held when the statement is mailed. The client must be familiar with the following terms to have a reasonably good understanding of the statement.

EXHIBIT 3-1

Daily Operating Statement

(Five weeks from ________ to ________)

	M	Tu	W	Th	F
Capital (includes unrealized gains and losses)					
Margin on open trades					
Gross power					
Risk on open trades					
Net power					
Additions and withdrawals					

	M	Tu	W	Th	F
Capital (includes unrealized gains and losses)					
Margin on open trades					
Gross power					
Risk on open trades					
Net power					
Additions and withdrawals					

	M	Tu	W	Th	F
Capital (includes unrealized gains and losses)					
Margin on open trades					
Gross power					
Risk on open trades					
Net power					
Additions and withdrawals					

	M	Tu	W	Th	F
Capital (includes unrealized gains and losses)					
Margin on open trades					
Gross power					
Risk on open trades					
Net power					
Additions and withdrawals					

"Credit or cash balance" represents the funds deposited into the account, modified by the realized profits or losses from positions that have been closed out. The credit balance is not affected by open positions, even though they may represent paper profits or losses. The only way the original credit balance represented by the customer's deposit of margin may be affected is by an additional deposit, a withdrawal, or the closing out of a position at a profit or loss. The margin requirements established by the broker to support open positions do not appear on the statement but merely reduce the amount of the credit balance left free for taking other positions.

"Equity" is the amount of money the account would be worth if all open positions were liquidated. If there were no open positions in an account, credit balance and equity would be identical. If there were positions, equity would be determined by adding open profits less commissions to the credit balance and subtracting open losses plus commissions. Most firms indicate the net open profits and losses on all positions on the statement to show the customers exactly where they stand. This plays havoc with the common practice of ignoring open losses in the hope that they will go away but is a desirable way of making certain that clients know exactly where they stand. A statement that indicates net open profits and losses is frequently called an "equity statement." Many firms also indicate on the monthly statements considerable other information such as profits and losses for the year to date or the total of commissions paid. This not only helps the clients know where they are but also helps the firms' compliance departments when customers who lose maintain that they had no idea what was happening. Statements which are clear, sent promptly, and accepted without protest provide considerable cheer for a firm's attorney who is using ratification as a defense against a complaint from an unhappy loser.

Transfers of funds made among a customer's various accounts are also shown on the monthly statement. Transfers are indicated by a debit in one account and a corresponding credit in another. Such transfers may be made when the same customer is trading securities and options as well as futures. Some firms provide all the information on one statement. Most provide different statements for the various types of accounts, which are distinguished from one another by slight variations in the account numbers.

REGULATORY REQUIREMENTS

In addition to the rules of the various exchanges and the brokerage house which has been chosen, the trader may be concerned with some of the regulations imposed by the CFTC. This organization has many of the same functions relating to futures exchanges and trading that the SEC has relating to security exchanges and trading. Just as the SEC has delegated some of its functions to a trade association, the National Association of Securities Dealers (NASD), the CFTC has encouraged the creation of a counterpart organization, the National Futures Association (NFA). Most regulations of the CFTC and NFA, such as those which relate to licensing, capital requirements, and bookkeeping, are of concern primarily to brokerage houses and their employees, but some regulations apply to individual traders.

Individual traders, of course, are precluded from engaging in manipulative and other practices that may distort markets. Large traders are frequently required to report the sizes of their open positions or may be precluded from exceeding stated limits. To provide accurate information on the activities of large and small traders, the CFTC requires large traders to file reports that can be compared with the total number of open positions available from clearing organizations to arrive at the total of small positions. These reports are easily prepared and need be of no concern to the trader who complies. Most brokerage houses dealing with large clients are willing to prepare the forms on behalf of the clients if they are aware of any trading done elsewhere by the same clients. The current sizes of positions which must be reported may be easily learned by customers from their brokerage houses or from the CFTC.

Traders who carry unusually large positions may be concerned with maximum position limits in some, but not all, futures which are considerably above the reportable positions. These limits are set by the exchanges or the CFTC and are designed to preclude disorder in markets and help prevent manipulation. These limits not only apply to individual accounts but may be applied to multiple accounts directly or indirectly controlled by one person or to two or more traders acting in concert. They may be of concern to pool operators and others who manage large amounts of capital and related accounts.

Most individual traders do not trade on such a large scale that they should be concerned with these limits. Reportable positions typically range from about 25 to 200 contracts, and position limits may be 500 or more contracts. Exceptions are made for bona fide hedgers. For those who do trade on a grand scale, however, it should be noted that the CFTC takes its reportable position limit requirements quite seriously. Its attitude toward maximum position limits is downright humorless.

TAX CONSIDERATIONS

Commodity positions in the futures markets have long been considered to represent contracts to buy or sell rather than actual ownership of a commodity. The margin required by a broker is viewed as a performance deposit and not as a payment in the usual sense of the word. When a contract is liquidated, the profit or loss merely represents the price difference from the level at which the contract was made, adjusted by commissions and fees. There are those who quarrel with designations of futures positions as "property," but they have been generally accepted as such and are considered to be capital assets. Although they are not regarded as securities (chiefly because they are seen as primary rather than secondary investments and hence do not qualify as a transaction whereby money is invested in a common enterprise with the expectation of profits to be derived solely from the efforts of someone else), futures contracts are usually subject to capital gains treatment; however, it differs from that used for securities.

Futures trading does not create the deductible interest expense that stock trading on margin does because no interest is charged on commodity accounts unless they are in deficit or undermargined enough to require the broker to deposit its own funds with the clearing organization, pending the receipt of adequate funds from the client, in which case interest may be charged.

No state or federal taxes are charged directly on transactions. The cost of a trade for tax purposes includes the commission charged.

Before the passage of the Economic Recovery Tax Act of 1981, the rules affecting the tax treatment of futures positions were rather simple. Speculative positions held for 6 months or less were subject to short-term capital gains treatment. Those held for more than 6 months were treated as long-term capital gains. This was true even when securities and most other capital assets had to be held for more than 1 year to be accorded long-term treatment. Positions liquidated at varying times are required by the CFTC and by many exchanges to be liquidated on a first-in, first-out basis unless the customer specifically requests the broker to liquidate in a different order. Such instructions must be indicated on the trade confirmation. There is no problem with physical delivery of certificates because there are none. There is no provision in the futures markets for short sales against the box.

Capital Gains Treatment

The tax treatment of a futures position depends on whether it was speculative or a hedge. Hedging carried on in the day-to-day dealings of a business generally results in current operating expenses or credits—and therefore in fully taxable operating profits and losses rather than capital gains or losses.

Just where hedging ends and speculation begins and just who is a bona fide hedger have never been easy to determine. There appears to be little question that bona fide hedgers are benefited by lower margin requirements and that losses resulting from them are fully deductible and gains fully taxable as ordinary income. It is less clear, however, just what "bona fide" is and even what a "hedge" is. The definitions utilized by the CFTC, the IRS, and the futures exchanges have often differed materially. Brokerage houses have sometimes defined hedging somewhat liberally in order to allow large traders to utilize lower margin requirements.

The tax act of 1981 made some substantial changes in the tax treatment of futures, primarily to eliminate the use of tax straddles for tax purposes. Such straddles for many years had been widely used to defer the payment of taxes or convert short-term gains into long-term gains, or even both. Those who used such straddles effectively might reduce taxes, defer their payment for long periods, convert ordinary income into capital gains, or even achieve a combination of these benefits. Those who tried these same practices ineffectively provided a lucrative source of business for attorneys attempting to recover losses in trades which the customer had been told, or allegedly told, were without risk. Although many futures were used for so-called tax straddles, metals and financial instruments were especially popular.

The 1981 tax act effectively ended these tax games simply by modifying capital gains treatment. Regulated futures contracts (RFCs) and similar instruments such as forward contracts were henceforth to be treated at the same rates whether positions were long or short and no matter how long they were held. Gains on futures would be treated as 60 percent long-term and 40 percent short-term. With 40 percent of long-term gains taxable and the maximum tax rate 50 percent, a trader in the 50 percent bracket who was not affected by the alternative minimum tax would pay a total tax on gains of 32 percent (50 percent on the 40 percent short-term portion equaling 20 percent, plus 50 percent on the taxable 40 percent of the 60 percent long-term portion equaling 12 percent).

The recently enacted Taxpayer Relief Act of 1997 (and subsequent acts) have reduced short-term and long-term tax rates to 39.6 percent and 20 percent, respectively, thereby reducing the tax burden to 27.84 percent. However, the 18 percent tax rate on long-term gains that will become effective on December 31, 2000, will not affect futures traders (the rate only applies to a "qualified 5-year gain," a new terminology that specifically requires a 5-year holding period).

It is also required that all open futures positions be marked "to the market" at the close of trading on December 31 and taxed accordingly whether the positions are open or closed. As a result, it is no longer possible to establish straddle positions with minimum risk or reward potentials, liquidate the losing sides, maintain the profitable sides, and deduct the losses. The never-ending battle between the IRS and those looking for ways to reduce, avoid, or eliminate taxes has thereby effectively moved to other arenas.

It should be noted that regulations evolving from this legislation and interpretations concerning them have not yet been entirely clarified. The Tax Reform Act of 1984 answered some questions, particularly those involving options on RFCs, indexes, and foreign currencies. Most of these are treated in the same manner as futures contracts. Nevertheless, those involved in hedging, cash-and-carry transactions, futures options, and other instruments that are like RFCs but are not RFCs are still well advised to consult a tax expert relative to any special problems that might concern them and not rely upon casual inexpert advice.

Other Issues

Tax problems have always varied widely among individual speculators and among businesses that deal primarily in commodities. There are many new products. Some seem to straddle the line between securities and futures. Some contracts, such as leverage contracts in metals, are similar to futures contracts purchased from a dealer on a principal basis just as securities are sometimes purchased from over-the-counter dealers rather than through brokers. Defining leverage contracts is difficult enough without using amateur sources to ascertain their correct tax treatment.

Further tax decisions involving futures will doubtless be made by the tax court as new laws are passed and old ones modified and as more regulations are issued and tested. Investors, traders, and dealers in futures would do well to consult with professional tax advisers before making any important assumptions about tax exposures departing from the ordinary. Employees of brokerage companies should be especially careful when giving advice involving tax or legal considerations.

4

CHAPTER

The Behavior of Futures Prices

> "The market looks a lot more efficient from across the Hudson than from across the Charles."
>
> —*Fischer Black*

INTRODUCTION

Scholars and traders alike are interested in gaining an understanding of the behavior of futures prices. Although the former might be interested chiefly in satisfying intellectual curiosity and the latter in making money through skilled forecasting, there is nothing to preclude a scholar from choosing to trade or a trader from electing to take a scholarly approach to trading.

It should be realized at the outset that of all games played, the futures market is certainly among the most difficult. Prices respond in often unpredictable ways and to varying degrees to a huge number of unpredictable events. Given the variation in both the inputs and the reactions to the inputs because of different amounts of discounting by the markets, it is obvious that the inputs are basically erratic and thus create a game not based purely upon skill or laws of probability, resulting in extremely difficult analysis. Many strategies can be used in different futures markets under varying conditions over different periods and may succeed some of only applies to a "qualified 5-year gain," a new terminology that specifically requires a 5-year holding period).

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As if all this did not make matters difficult enough, the trader's search for truth is clouded by sometimes glib self-serving assertions of those with something to sell. The futures business is populated by a host of people who maintain that they have methods of predicting prices but whose methods are closely guarded "proprietary" secrets. Others hint at the great successes they have had with brokerage accounts, managed accounts, or their own trading, but somehow it is impossible to get enough statistical information to validate the assertions. Sometimes the samples used are too small to be meaningful, or the time over which results were achieved might be too short to be significant because unusual conditions might have unduly influenced results. The fact that the data utilized might be suspect is bad enough, but the danger that some of those who report the results might report them in a biased way makes intelligent analysis all the more difficult.

Those interested in analyzing short-run price changes in speculative markets must understand the concept of the efficient market and its accompanying statistical model, the random walk. It is up to the readers to decide whether to accept or reject this theory, but if they are to do so, they ought to make certain that their sources of data are unbiased. The efficient-market hypothesis suggests that futures prices are extremely difficult or even impossible to forecast. This concept is about as popular with many brokerage house research departments and publishers of advisory letters as the conclusions of the Surgeon General are to a cigarette manufacturer.

Even if the random-walk model best approximates reality in the short run, long speculators could still profit from long-run price changes if average upward price changes exceeded average downward price changes. If there is an upward bias, do speculators profit solely and simply because they bear the risks that hedgers transfer to them, or do they profit because they can forecast prices successfully? The "risk premium" concept is a common point of departure in the literature of futures price behavior, and the cases for and against the existence of such a premium are analyzed later in this chapter.

Whether or not there is a risk premium and, if so, whether it leads to a reasonable expectation of adequate profits, there may be enough observable biases in futures prices to give hope to a speculator attempting to forecast prices. Specific processes of decision making are discussed further in Chapters 6 and 7.

THE EFFICIENT-MARKET HYPOTHESIS

All serious students of futures or stock markets must understand the implications of the efficient-market hypothesis and determine for themselves whether to accept or reject its conclusions. There is almost as much debate about this hypothesis in the financial community as there is about religion among theologians. The debate may also go on as long without being settled. It should be noted, however, that this hypothesis is widely accepted in one form or another in the scholarly community and is apparently most often rejected not by those who have any evidence refuting the theory, if there is any such evidence, but rather by those who simply do not like its conclusions.

It is possible only to summarize the hypothesis here and indicate the implications for the futures trader, but those who wish to read further will find no shortage of interesting and thought-provoking reference material.[1]

An efficient market is one in which there are large numbers of equally informed, actively competing people attempting to maximize profits. In such a market, at any moment, price reflects all available information, as well as all events expected to occur in the foreseeable future. Holbrook Working was the first in the futures field to offer a theory of

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[1] Edwin J. Elton and Martin J. Gruber, *Modern Portfolio Theory and Investment Analysis,* 3d ed (New York: John Wiley & Sons, 1987); Stephen Taylor, *Modeling Financial Time Series* (London: John Wiley & Sons, 1986); Michael R. Rosenberg, *Currency Forecasting* (Chicago: Irwin Professional Publishing, 1996).

expectations that rests on the premise that futures reflect anticipated changes in supply and demand rather than on their immediate values.[2]

It is generally agreed that the fundamental laws of supply and demand determine the long-run price behavior of futures. It is just as generally agreed that these laws have certainly failed in the short run to provide a similar insight. Most traders will agree that in the short run there is simply no significant correlation between "fundamentals" and prices, yet most traders establish and liquidate futures positions in the short run. It might be noted that even in the long run, supply and demand data are more useful in explaining why markets acted as they did rather than providing any help in forecasting what they are going to do.

Premises

Most students of the market have followed the lead of Harry Roberts in subdividing the concept of the efficient market into three levels.[3] Price changes in efficient markets are independent and follow a pattern popularly referred to as a "random walk."[4]

The weak form of market efficiency indicates that prices reflect all information available from past prices. It would be reasonable to conclude that information about open interest and volume would also be reflected in prices if such information were of any predictive value in the first place. Scant evidence exists indicating that the market is not at least this efficient, despite the howls of anguish such a conclusion raises from those who use naïve technical devices as a basis for trading decisions.

The second level of efficiency, usually called the "semistrong approach," maintains, with substantial statistical evidence, that all published information is already reflected in prices. This indicates that the successful trader had better plan on doing more than merely reading publications.

The third level of efficiency appears to leave some hope for the trader. In this strictest, or strong, form the efficient-market hypothesis maintains that prices reflect all information that can be acquired, even by

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[2] Holbrook Working, "A Theory of Anticipatory Prices," *American Economic Review Proceedings,* 48 (May 1958), 191.

[3] H. V. Roberts, "Statistical versus Clinical Prediction of the Stock Market," unpublished paper presented to the Seminar on the Analysis of Security Prices, University of Chicago, May 1967.

[4] The common term "random walk" is used here, but it should be noted that statisticians distinguish between random walks and submartingales. A frequent error to be avoided is confusion of a random walk with a random variation.

hard-working imaginative researchers. This would indicate that prices reflect everything which is known or could reasonably become known, except, possibly, for inside information, which can lead to legal problems for the user of the information. Some might conclude that even if such information were to leak, it, too, would be reflected in prices. The result, if the strong form of efficiency describes reality, is that market prices reflect current values precisely and change only as new events dictate. Futures, like stocks, are therefore worth precisely what they are selling for, and the best estimate of tomorrow's opening price is today's closing price modified by any events which occur between them, including the reactions to the events. The availability of computers to digest and analyze data quickly and accurately has made markets even more efficient and therefore profits harder to gain than before. This would seem to contradict the implications of those who indicate that they have developed some complex (and usually secret) program to beat the market. It is the use of sophisticated analysis by alert traders that makes the market as efficient as it is.

Based on the bulk of academic studies that support the theory of efficient capital markets, some have concluded that profitable futures trading is impossible in the absence of private (also known as "insider" and, occasionally, "illegal") information. They reject the possibility that successful methodologies for exploiting market inefficiencies may not appear in academic journals simply because such studies could provide significant profit opportunities for their authors. It is interesting to note that two often-quoted academicians in the field of inefficient markets are now employed as successful commodity trading advisors.[5] The die-hard efficient-market apologist is likely to answer that with thousands of traders operating in a handful of markets, it would be indeed remarkable if no one had a good record. If such an apologist were sufficiently cynical, he or she might point out that if enough monkeys were chained to enough pianos for long enough, one of them would eventually compose a sonata.

Behavior of Traders

If price changes are formed according to supply and demand, it is important to analyze in more depth the behavior of traders in response to news.

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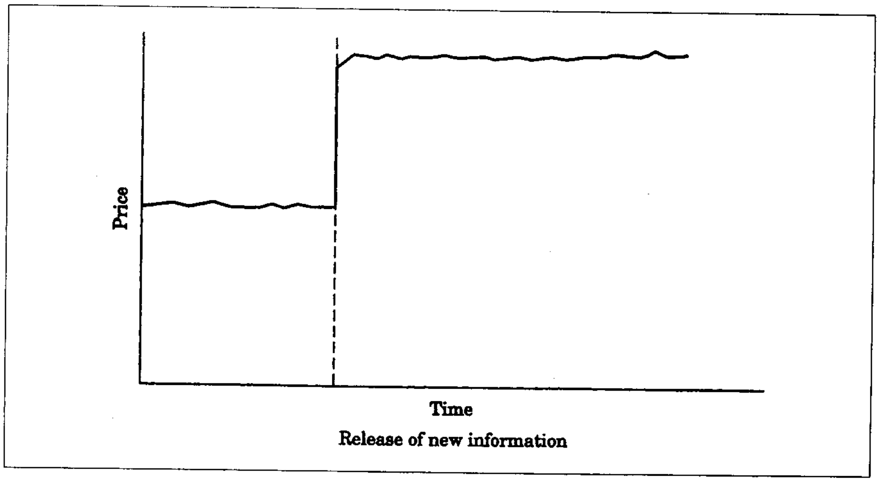
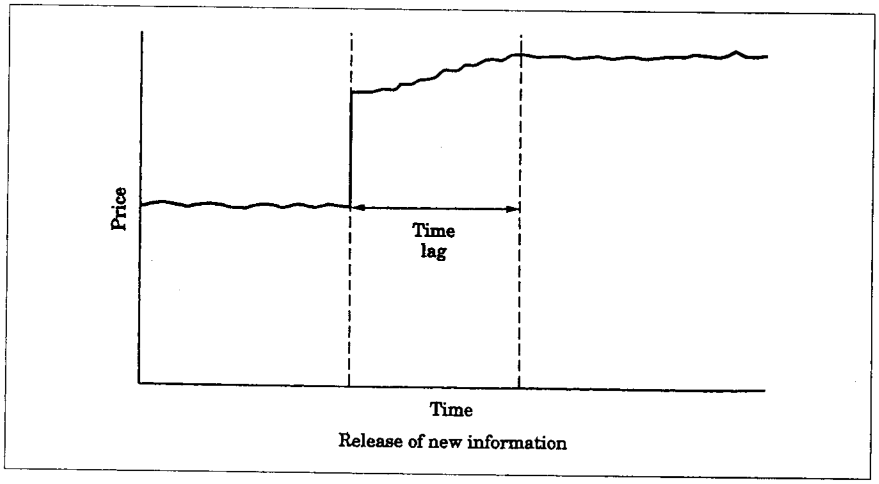
[5] We are referring to Dr. Victor Niederhoffer, of Niederhoffer Investments, Inc., whose academic work includes studies of price reversals in stocks and the effect of earnings on investment returns, and Dr. Sanford J. Grossman of Quantitative Financial Strategies, an expert in modeling the characteristics of capital market behavior.

FIGURE 4-1

Efficient versus inefficient markets.



(*a*) An efficient market responds quickly to releases of new information.



(*b*) An efficient market may exhibit a time lag. A prolonged time lag is called a market trend.

Source: Ben Warwick, *Event Trading* (Chicago: Irwin Professional, 1996), p. 16. Used with permission.

In a *totally* efficient market, when no new information is available, no new market positions would be taken, and price would fluctuate randomly about the intrinsic value of the traded asset. When new information is released, market participants would quickly analyze the data, and the price would instantaneously adjust to a new equilibrium level (Figure 4-1*a*).

Moving from such an ideal market, prices might not adjust as quickly if information is not quickly assimilated to all market participants, or some of the participants are able to more accurately discern the effect of the new information on the tradable asset. In such a circumstance, prices might respond as shown in Figure 4-1*b*. The existence of a time lag might allow for profitable trading in markets, as shown by Rendelmen[6] in equities, Larson[7] in futures, and Schneeweis[8] in debt securities. But if time lags occur only sporadically, their use as a market-beating strategy would be limited. Thus on each input of bullish news a trader could not establish a long position and expect prices to work higher, nor could she or he take a short position directly after the issuance of bearish news and have a high probability of profit.

The random-walk theorists agree that it is unlikely that their model describes the behavior of futures price changes exactly. Yet they assert that although successive price changes may not be strictly independent, the amount of dependence is unimportant. If there is no such strategy, then a simple policy of buy and hold will equal the results from any sophisticated procedure for timing. Therefore, unless a trader can improve on the buy-and-hold policy, the independence assumption of the random-walk model is an adequate description of reality.

All this does *not* mean that short-term traders will not or cannot make money trading futures; it *does* mean that on the average, those traders will not beat a buy-and-hold strategy with information they obtain from historical data.

Perhaps the clearest method of testing the random-walk theory is to assume for the moment that it is *true* and that it does present an excellent "jumping-off point" for the analysis of the behavior of futures prices. To many traders, this assertion may be heresy, yet if the theory is not backed by significant statistical evidence, it can be rejected.

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[6] Richard J. Rendelman, C. Jones, and H. Latane. "Empirical Anomalies Based on Unexpected Earnings and the Importance of Risk Adjustments," *Journal of Financial Economics* **10** (1982), 269–287.

[7] Arnold Larson, "Measurement of a Random Process in Futures Prices," *Food Research Institute Studies,* **1,** No. 3 (November 1960).

[8] Tom Schneeweis. "Capital Market Efficiency in Fixed Income Securities." *Review of Business and Economics Research* (Winter 1980), 34–42.

EMPIRICAL STUDIES

Introduction

The first attempts to develop models to predict or even explain prices predated the Tulip Bubble, but credit for the first major attempt to apply modern mathematical and statistical techniques to the theory of a theory of speculative prices probably belongs to Louis Bachelier. His pioneering doctoral dissertation "*Théorie de la Spéculation*"[9] was utilized by Holbrook Working, who inspired much thought and research through his production of many highly respected studies of futures prices.

Those who have argued that futures price changes are random in nature have based their assertion on the following principles: (1) prices changes are such that they could have been generated by independent trials from a simple chance model such as a roulette wheel; (2) no one has been able to show that price changes exhibit a systematic pattern, even though present statistical techniques are capable of detecting data that have come from a significantly nonrandom process.

The first point is merely suggestive because proving the existence of randomness is impossible. Holbrook Working, writing as early as 1934, observed:

> It has several times been noted that time series commonly possess in many respects the characteristics of cumulated random numbers. The separate items in such time series are by no means random in character, but the *changes* between successive items tend to be largely random. This characteristic has been noted conspicuously in sensitive commodity prices. . . .[10]

In support of this position it has been suggested that the output of a simple roulette wheel could duplicate many of the characteristic features of futures price movements. Results of this approach are illustrated in Figures 4-2 and 4-3. Figure 4-2 represents the weekly changes in closing prices of the live cattle market from 1993 to 1997. Figure 4-3 represents change generated by a random number generator. Even though the chance model in Figure 4-3 cannot duplicate history except in the sense that one evening at a gambling casino duplicates another, the similarity of both series should be striking enough to startle any rational would-be trader. Certainly the plotting of a series of price changes that could be generated

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[9] Gauthier-Villars, Paris, 1900.

[10] Holbrook Working, "A Random-Difference Series for Use in the Analysis of Time Series," *Journal of the American Statistical Association* **29** (1934), 11.

FIGURE 4–2

Weekly price changes, live cattle market.

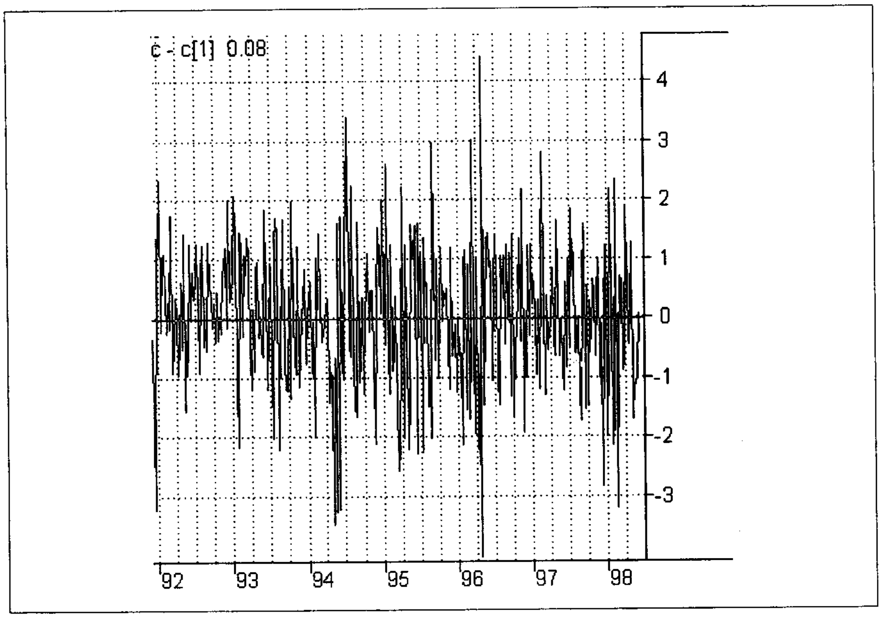

Chart created using Tradestation 4.0 by Omega Research, Inc.

from a random-number table is not calculated to inspire confidence in the recurring "patterns" supposedly embedded in price history.

No researcher has tested the overall performance of futures markets, assessing simultaneously the efficiency of the market to transfer risks, forward price, transmit information, aid firms in obtaining capital, and allocate resources and inventory. Such an assessment would most likely find that futures markets are quite effective.[11] Nonetheless, in this section we concentrate on examining the ability of market participants and academicians to make accurate price forecasts through a variety of methods. The following is a review of the more important studies that analyze the value of the efficient market hypothesis (EMH) in the futures markets. Note that, like any hypothesis, the EMH cannot be proved, only disproved. Thus, the bulk of the research presented is an attempt to discover if the futures markets can be found to deviate from randomness to enough to provide excess returns.

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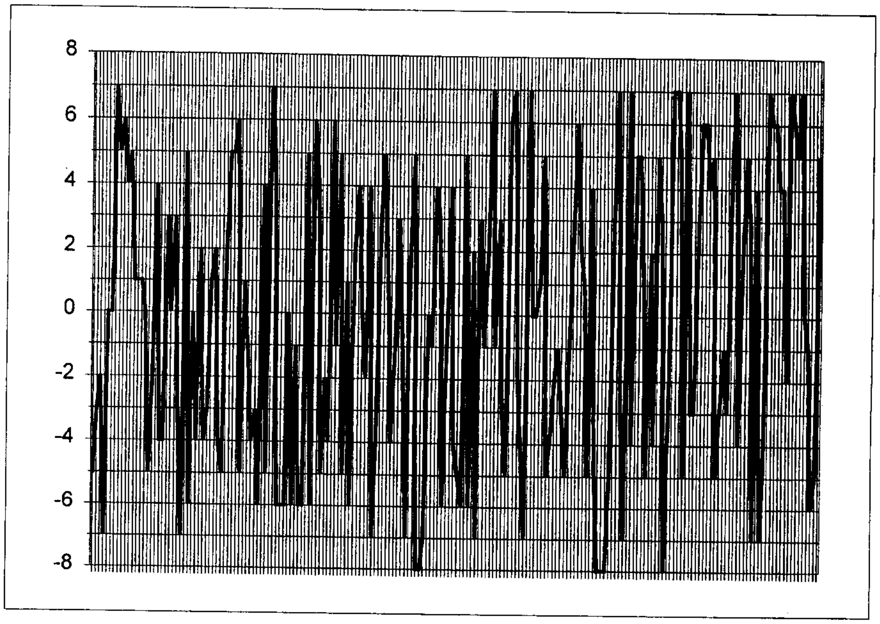
[11] Raymond M. Leuthold, Joan C Junkus, and Jean E. Cordier, *The Theory and Practice of Futures Markets* (Lexington, Mass.: Lexington Books, 1989), p. 113.

FIGURE 4–3

Simulated weekly market changes using a random-number generator.



Level One: Weak-Form Efficiency

The weak form of the EMH indicates that prices fully reflect all information available from past prices. It would be reasonable to conclude that information about volume and open interest would also be reflected in prices if such information had any predictive value. Various weak-form studies, including price patterns, filter rules, spectral analysis, and chaos theory are presented as evidence in the controversy.

Price Patterns[12]

Price pattern techniques utilize certain definable and systematic algorithms, which are based solely on past transactional information (i.e., price, volume, and open interest), to "beat" a passive, buy-and-hold strategy in the commodity markets. The term *beat* describes a set of pattern rules that can either mate-

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[12] This section of Chapter 4 is partially adapted from Chapter 17 of *The Handbook of Managed Futures* (Chicago: McGraw-Hill, 1997, pp. 333–344), titled "Inefficiencies and Long-Term Profitability."

rially exceed the return of a buy-and-hold strategy or equal the return of the buy-and-hold strategy with less risk.[13] Of special note is the work of Houthaker,[14] who examined various stop-loss rules for wheat and corn during between 1921 and 1939 and 1947 and 1956. His approach was to compare profits (and losses) to a buy-and-hold (and/or sell-and-hold) strategy. An example of such a strategy would be to liquidate if the price falls below the entry level, or if prices fall to 95 percent of their entry level, and so on. If price changes were random, such stop-loss rules would have no effect on long-term average returns. The results indicated some evidence against randomness. In every futures contract, whether long or short, improvement was possible by using the stop-loss rules. The improvements were not always large (in most cases, not large enough to cover transaction costs). The stop-loss rules seemed to be more effective in reducing losses than in increasing profits. And in no case did a stop policy turn an unprofitable buy-and-hold (or sell-and-hold) strategy into a profitable one. He finished his study by outlining a theory in support of certain types of price dependencies within the futures markets.

Stevenson and Bear[15] analyzed the use of both trading rules and statistical techniques on corn and soybean prices during 1957 to 1968. They first applied statistical tests of frequency distribution, serial correlations, and analysis of runs and found evidence of nonrandomness (negative correlation in the short term and positive correlation over the long term). Next, they applied three trading techniques to this same price series. One technique consisted of stop-loss rules with entry rules that allowed establishing positions after the market had moved a predefined percentage. Entry rules were tested that allowed establishing positions with the market and then against market movements. The third technique involved buying (or selling) when the market moved a predefined percentage and then selling (or buying) after the market had gone up or down a predetermined amount. After the position was closed, the process was repeated. For all three trading strategies the amount of price movement allowed before stop losses, market entry, and profit (loss) points were triggered was varied in increments of 1.5 percent, 3.0 percent, and 5.0 percent of the price of each commodity. Commissions were included. The first technique (stop-loss only) was able to outperform a buy-and-hold strategy to a small extent.

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[13] Ben Warwick, *Event Trading* (Chicago: Irwin Professional Publishing, 1996), p. 36.

[14] H. S. Houthaker, "Systematic and Random Elements in Short-Term Price Movements," *American Economic Review* **51** (1961), 164–172.

[15] R. A. Stevenson, and R. M. Bear, "Commodity Futures: Trends or Random Walk?" Reprinted in Peck (1977), pp. 279–294.

The second technique (variable entry with stop-loss rules) produced somewhat more interesting results. Entry with the market (i.e., going long after a price rise, or a short position after falling prices) using the larger filters produced results superior to buy-and-hold. Entry against the market (i.e., establishing a short position after a rally or a long position after a dip) produced better results for the smaller filters but was poorer than buy-and-hold. These results confirmed the tendency toward reversal in small price movements about a larger systematic trend. The final technique (variable entry and profit capture) was a poor performer. In summary, the profitability found over a buy-and-hold philosophy by playing long-term movements on both the long and short sides casts some doubt on the applicability of the random walk model on the futures markets for the periods and markets studied. Table 4-1 shows the results of similar studies in other markets.

TABLE 4–1

Market Inefficiencies Research

Researcher	Title	Comments
Leuthold (1972)	"An Analysis of the Futures-Cash Price Basis for Live Beef Cattle"[16]	Filter rules were used to find nonlinear dependencies.
Brock, LeBaron, Lakonishok (1992)	"Simple Technical Trading Rules and the Stochastic Properties of Stock Returns"[17]	Support and resistance levels gave useful buy and sell signals.
Taylor (1994) rule	"Trading Futures Using a Channel Rule: A Study of the Predictive Power of Technical Analysis with Currency Examples"[18]	A simple technical trading produced profits in currency markets over a multiyear period.
Blume, Easley, O'Hara (1994)	"Market Statistics and Technical Analysis: The Role of Volume"[19]	Volume provides information on information quality that cannot be deduced from pure price data.

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[16] R. M. Leuthold, "An Analysis of the Futures-Cash Price basis for Live Beef Cattle," *North Central Journal of Agricultural Economics* 1 (1979), 47–52.

[17] W. Brock, Blake LeBaron, and Joseph Lakonishok, "Simple Technical Trading Rules and the Stochastic Properties of Stock Returns," *The Journal of Finance* 12 (1992).

[18] Stephen J. Taylor, "Trading Rules Using a Channel Rule: A Study of the Predictive Power of Technical Analysis with Currency Examples," *The Journal of Futures Markets* 14 (1994), 215–235.

[19] Lawrence Blume, D. Easley, and M. O'Hara, "Market Statistics and Technical Analysis: The Role of Volume," *The Journal of Finance* 49 (1994). 153–181.

One of the most ambitious attempts at exploring the efficacy of weak-form analysis was performed by Lukac, Brorsen, and Irwin.[20] Their study investigated the returns of twelve systems using a portfolio of twelve commodities. Four systems were found to generate aggregate portfolio returns significantly greater than zero. Their results are shown in Table 4-2. The researchers also found that in the absence of inflation their trading rules were less effective, possibly due to the lack of large price movements.

Filter Rules

One market strategy that has been frequently used to profit in the futures markets is illustrated in Figure 4-4. The logic behind its efficacy is as follows. As long as no new information enters the market, prices fluctuate randomly within the two barriers about the "intrinsic" price. If the actual price differs too much from the intrinsic price, market "insiders" will step in and purchase or sell the asset. This will keep the price between the security price barriers (also known as *channel lines*). However, if new information comes into the market, then a new equilibrium price will be determined. If the news is very favorable, then the price should move up to a new equilib-

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[20] L. Lukac, Wade Brorsen, and Scott H. Irwin, *A Comparison of Twelve Technical Trading Systems* (Greenville, SC: Traders Press, 1990).

TABLE 4-2

Four Trading Systems with Statistically Significant Returns, 1978–1984*

	% Return						
System	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**
CHL	6.1	47.9	81.6	21.8	28.3	19.9	28.0
DRP	34.8	63.8	88.7	31.0	–13.4	–20.0	38.5
MII	12.9	41.6	87.8	54.6	–30.7	3.1	7.1
DMC	17.6	26.8	85.4	5.9	22.9	1.9	–1.6

System	Description	Specifications
CHL	Close Channel System	Uses a daily price channel to trigger buy and sell signals
DRP	Directional Parabolic System	Combines oscillator with moving average system.
MII	MII Price Channel System	Uses a daily price channel, always long or short
DMC	Dual Moving Average Crossover System	Buys when short-term moving average crosses above long-term average; sells when long-term MA crosses above short-term MA.

* Source: L. Lukac, Wade Brorsen, and Scott H. Irwin, *A Comparison of Twelve Technical Trading Systems* (Greenville, SC: Traders Press, 1990).

FIGURE 4-4

Filter rule example (U.S. dollar index).

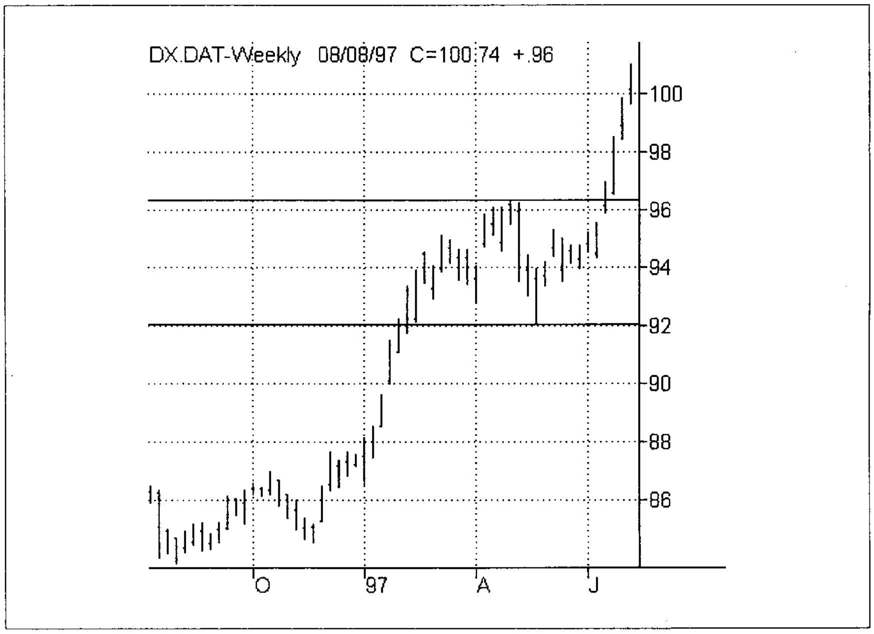

Chart created using Tradestation 4.0 by Omega Research, Inc.

rium, well above the old price. Traders will know that this is occurring when the price breaks through the old barriers. If investors purchase at this point, they will benefit from the price increase to the new equilibrium level. Likewise, if bad news is forthcoming, the futures price should drop to a lower equilibrium level. This strategy is called a *filter rule.*[21]

Most of the early work in trying to simulate technical trading rules centered on security prices. Alexander[22] developed a filter technique in order to apply a criterion similar to that used by some traders. The filter was defined as follows: As soon as the closing price moves up *x* percent from some initial point, the security is bought and held until its price

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[21] Edwin J. Elton, and Martin J. Gruber, *Modern Portfolio Theory and Investment Analysis* (New York: John Wiley & Sons, 1987), p. 374.

[22] Sidney Alexander, "Price Movements in Speculative Markets: Trends or Random Walks," No. 2, reprinted in Paul Cootner, ed., *The Random Character of Stock Market Prices* (Cambridge, Mass.: The M.I.T. Press, 1964), pp. 338–372.

moves down x percent from a high subsequent to the first purchase, at which time the long position is abandoned and a short position instituted; the short position is maintained until the closing price again rises x percent above a low subsequent to the previous sell, at which time the short position is covered and a long position is entered. Alexander used filters with varying values of x between 1 and 50 percent and applied the technique to American industrial stock price averages from 1897 to 1959. He concluded that his filter rule yields positive results for filters ranging from $x = 5$ to $x = 30$ percent. In other words, he finds a tendency for a price change in a stock price average to be followed by a subsequent price change in the same direction. The profitability of this filter technique may imply similar results for other trend-following techniques, but because the data consisted of changes in stock price *averages* and because changes in price *averages* have behavioral characteristics that differ from those of changes in the price of an individual stock, Alexander's results would not necessarily be meaningful in a pragmatic trading situation.

Cootner[23] examined the results of a rule that permitted a much more rapid response to changes of direction than Alexander's strategy. The decision rule was stated as follows: Buy the stock when the price exceeds a 40-week moving average by more than a given percentage (threshold amount), and sell the stock whenever the price dips below the moving average by *any* amount; sell the stock short whenever it falls below the moving average by more than the threshold amount, and cover the short sale whenever the price rises above the moving average by *any* amount. This rule was applied to the weekly closing prices of a sample of 45 stocks listed on the New York Stock Exchange over a period that generally included the years 1956 to 1960.

Rates of return using a 0 percent and a 5 percent threshold rate were provided, the latter rate lowering the excessive transactions that tend to occur when the stock price remains in a narrow range. Both strategies were superior to buy-and-hold *only* if gross profits were considered. After commissions neither strategy outperformed the simple investment rule.

In a careful analysis covering all the individual stocks of the Dow Jones Industrial Average, Fama and Blume[24] tested 24 filters ranging from ½ to 50 percent over daily data for approximately 5 years, ending in 1962.

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[23] Paul Cootner, "Stock Prices: Random vs. Systematic Changes," reprinted in Paul Cootner, ed., *The Random Character of Stock Market Prices* (Cambridge, Mass.: The M.I.T. Press, 1964), pp. 231–252.

[24] Eugene Fama and Marshall Blume, "Filter Rules and Stock-Market Trading," *Journal of Business*, **39** (Supplement 1966), 226–241.

When commissions are included, the largest profits under the filter technique are those of the broker. When commissions are omitted, the returns from the filter technique are improved but are *still* inferior to the returns from buy-and-hold for all except two securities of the 30—Alcoa and Union Carbide. In addition, empirical evidence is presented which indicates that Alexander's results tended to overstate the actual profitability of the filter technique versus buy-and-hold. Such bias, it is believed, appears because the use of indices overstates the profitability of short sales. Because short sellers must incur the cost of paying all dividends, the index is reduced by dividend payments, and therefore the time spent in being short will introduce a bias estimated at about 2 percentage points in favor of the filter technique.

Trend-Following Strategies

Trend-following strategies are designed to catch the overall market trend, so the method usually generates buy signals when the market is going up and sell signals when the market is going down. The profitability of these strategies depends primarily on the amount of serial correlation exhibited by the market. In other words, if "up" days are statistically more likely to be followed by another up day (and vice versa), trend followers should be profitable over the long term if they trade a diversified portfolio of futures markets.

The presence of trends in the futures markets can be detected using variance ratio tests, which measure the distinction between anticipatory and random elements in a price series. The test is based on the hypothesis that price changes following a stable random walk will have a random variance component that increases with time. For instance, if a commodity price series tends to vary up or down with a random variance of 0.1 over a 1-day interval, the random variance component would, on average, be 0.2 over a 2-day interval and 0.5 over a 5-day interval, and so on.[25] Using this method, Brinegar[26] found a weak but statistically significant tendency toward trend continuation (or *positive* serial correlation) in the prices of wheat, corn, and rye, ranging from 4 to 16 weeks. The amount of continuity the time frame varied with each commodity and was especially associated with periods of large price movements. A second important conclusion from Brinegar's study was the evidence of a slight "reaction tendency" (or *negative* correlation) for short periods of

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[25] Ibid., p. 375.

[26] C.S. Brinegar, "A Statistical Analysis of Speculative Price Behavior," *Food Research Institute Studies* 9, Supplement (1970).

approximately 1 to 2 weeks. Peterson, Ma, and Richey[27] used the same method to test seventeen futures markets from 1969 to 1987. They found results similar to Brinegar's (positive serial correlation in the long run and negative correlation after large price moves) in almost every market tested.

Like many tests of market inefficiency, the time frames tested significantly impact the results of the analysis. Irwin and Brorsen[28] found a strong positive association between economic uncertainty (i.e., inflation) and trading returns, suggesting that traders should expect lower returns during noninflationary periods. The results suggest that during inflationary periods, markets may exhibit inefficient behavior that can be exploited using a trend-following approach. Sadly, for the trend follower, the study suggests that profitable trading may depend on the ability to predict when periods of inflation are likely to occur—which merely creates a new problem. Markets are leading indicators, so our trader is faced with the problem of finding a leading indicator for a leading indicator.

Spectral Analysis

Spectral analysis is a statistical technique for decomposing a time series like futures prices. The method attempts to isolate the cyclical component of a time series and to use the information to predict the next peak or trough in prices. The evidence for cycles is not impressive, so the discussion of spectral analysis will be brief.

Spectral analysis can be compared with the swinging of the dial of a radio across a wave band. The signals received, however, are not words or music. At any particular frequency only the total *power* of the signal is measured. The static between "stations" would correspond to a purely random signal and would register as a small, constant amount. The "stations" themselves correspond to the frequencies of the transmission as well as the *strength* of each signal. Spectral analysis shows the size of the amplitude of each frequency found in a time series.

Monthly futures prices for a number of commodities for January 1950 through July 1965 were examined by Labys and Granger by spectral

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[27] Richard L. Peterson, Christopher Ma, and Robert Ritchey, "Dependence in Commodity Prices," *The Journal of Futures Markets* **12** (1994), No. 4, 429–446.

[28] Scott H. Irwin, and Wade Brorsen, "A Note on the Factors Affecting Technical Trading System Returns," *The Journal of Futures Markets* **7** (1985), No. 5, 591–595.

analysis.[29] In general, the series was flat and exhibited the behavior expected from a random-walk market. The only commodity that showed a slightly significant seasonal tendency which the authors would confirm was wheat. Cotton oil, potatoes, eggs, cocoa, corn, flax, lard, soybeans, soybean meal, soybean oil, cotton, rye, and oats generated the types of spectra that would generally confirm the random-walk model. Similar analysis was applied to weekly and daily futures prices. Fifteen years of weekly prices for corn, oats, rye, wheat, and soybeans were examined, and the shape of the spectra of these futures also confirmed the random-walk model. One year of daily prices for coffee, corn, oats, rye, rubber, soybeans, sugar, wheat, cocoa, and cotton was tested, and all but the last two indicated that the random-walk model provides a good explanation of price behavior. A small amount of negative serial correlation existed for cocoa and cotton.[30]

Chaos Theory

In 1960, a theoretical mathematician named Benoit Mandelbrot was asked to lecture in an economics class at Harvard University by the venerable professor Hendrik Houthakker. When he arrived, Mandelbrot was surprised to see the results of his research on the distribution of large and small incomes in an economy displayed on the blackboard of Houthakker's office. Mandelbrot made a querulous joke—"how could my diagram have materialized ahead of my lecture?"—but Houthakker did not know what Mandelbrot was talking about. The diagram had nothing to do with income distribution; it showed 8 years of cotton prices.[31]

Intrigued, Mandelbrot began studying the distribution of cotton prices and found that he could not fit the price changes into a normal (or bell-shaped) distribution. The normal distribution describes the way things vary in the natural world. Usually, measurements tend to stay near

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29. Walter C. Labys and C. W. J. Granger, *Speculation, Hedging and Commodity Price Forecasts* (Lexington, Mass.: D.C. Heath and Co., 1970), chap. 2.

30. Statistically minded readers who would like to dig deeper into time series and spectral analysis, and similar techniques, might refer productively to Andrew D. Seidel and Philip M. Ginsberg, *Commodities Trading Foundations, Analysis, and Operations* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1983). Studies are also available periodically on these and related subjects in various articles published by the Stanford Food Research Institute and in *The Journal of Futures Markets,* published by John Wiley & Sons, Inc., in affiliation with the Center for the Study of Futures Markets, Columbia Business School.

31. James Gleick, *Chaos: Making a New Science* (New York: Penguin Books, 1998), pp. 83–84.

an average point and manage to scatter around the average in a relatively smooth way. Mandelbrot found that there were substantially more large price changes than would be expected from the normal probability distribution. Even when he tried looking at the data in daily, weekly, and monthly increments, the number of extreme price changes he observed were surprisingly high.

Chaos theory is an attempt to explain why complex systems such as global economies and capital markets prices do not conform to traditional statistical models. Proponents of chaos theory claim that nonlinear dynamics can detect hidden patterns in prices or at least offer a chance to profit using trading rules in certain time frames. Vaga[32] prefers to call this approach the coherent market theory (CMT). According to Vaga, markets exhibit totally efficient, somewhat efficient, and nonefficient behavior in different periods. During nonefficient periods, the traditional risk-reward parameters of the market are skewed such that it is possible to increase return without increasing risk. His basis for such a theory is that markets behave more similarly to physical systems such as water flowing through a pipe and group behavior than what is commonly referred to as a "random" process.[33] Vaga claims that his CMT model more accurately describes the behavior of the market and explains why capital markets so stubbornly resist conforming to traditional statistical models.

The possibility that futures prices exhibit behavior more akin to a deterministic (nonrandom) process raises the possibility that short-term forecasting models may be improved by incorporating these new factors. However, from a practical viewpoint, chaos analysis procedures do not easily lend themselves to direct application in forecasting model construction.[34] Chaos theory is useful in that it may explain *why* different forms of inefficiency exist, but at present the theory is difficult to use as a standalone trading methodology.

Level Two: Semistrong Efficiency

Semistrong violations of the EMH imply that information is not instantaneously reflected in the price of a security. If there is a definable lag asso-

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[32] Tonis Vaga, *Profiting from Chaos* (New York: McGraw-Hill, 1994), p. 3.

[33] Ibid., p. 4.

[34] Gregory P. DeCoster, Walter C. Labys, and Douglas W. Mitchell, "Evidence of Chaos in Commodity Futures Prices," *The Journal of Futures Markets* **12** (1995), No. 3, 291–305.

ciated with the release of information, market participants could profit by trading immediately after the announcement to capture some of the excess return (see Figure 4-1*a* and *b*).

Like test of weak-form inefficiencies, a great majority of studies have confirmed the semistrong version of the EMH. But some studies show a time lag associated with the release of information in several markets. Larson[35] studied day-to-day changes in corn prices for two 10-year periods: 1922 to 1931 and 1949 to 1958. He measured the pattern followed by prices after inputs of new information. Larson found that about 81 percent of the price effect of new supply and demand information occurs on the day of the information release. He then noted a reaction, averaging about 8 percent dispersed over 4 days, away from the initial price movement, even though the first movement was not sufficient to discount all the news. The final 27 percent of price movement took an average of 45 days—a model consistent with Figure 4-1*b*.

The reaction of stocks to earnings announcements has been a popular subject of research over the past three decades. Most of the work has focused on the speed at which stock prices move in reaction to surprisingly positive or negative information. If an investor could buy (or sell) a stock shortly after an earnings release and earn a profit in excess of the underlying stock market return, then the market may be exhibiting a semistrong inefficiency. Numerous researchers, including Rendelmen and colleagues,[36] have found that such scenarios have occurred, especially when earnings deviate the greatest from their expected values. Schneeweis found a similar type of inefficiency associated with the downgrading of corporate debt.[37]

Without question, the ever-increasing computerization of the futures markets is making responses to new information quicker than ever. Thus, the efficacy of the above strategies in the current trading environment is left to the reader.

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[35] Arnold Larson, "Measurement of a Random Process in Futures Prices," Food Research Institute Studies 1, No. 3 (November 1960).

[36] Richard J. Rendelman, C. Jones, and H. Latane, "Empirical Anomalies Based on Unexpected Earnings and the Importance of Risk Adjustments," *Journal of Financial Economics* **10** (1982), 269–287.

[37] Tom Schneeweis, "Capital Market Efficiency in Fixed Income Securities," *Review of Business and Economics Research* (Winter 1980), 34–42.

Level Three: Strong-Form Efficiency

The strong form of the EMH is the most extreme; it states that there exists no information that can give a trader an edge in the markets. There is little debate that markets do not exhibit this type of behavior. Numerous studies have shown that corporate insiders—those privy to nonpublic information—have earned excess returns. If one could acquire similar information in the futures markets, profits would undoubtedly result. The bigger question is the cost of such information. Since insider trading is illegal, one would risk loss of freedom for an almost certain edge in the market. Thus, the risk in such an activity is not confined to market risk.

IS THERE A RISK PREMIUM IN FUTURES PRICES?

Another form of market inefficiency is the presence of a risk premium in futures prices. Keynes first advanced the hypothesis in an essay in the *Manchester Guardian Commercial* in 1923 in which he suggested that anyone could reap handsome profits by simply holding long positions in cotton futures throughout the crop year, year in and year out.[38] This affirmation came to be regarded as the "Keynesian theory of normal backwardation."[39]

Though for years severe problems in semantics were to persist in the literature, the theory in essence stated that although markets sometimes reflect carrying charges and sometimes are inverted, in either case a risk premium is a normal and continuing part of the difference between cash prices and futures prices. In other words, the theory required that the futures price be lower (biased downward) than the price expected to prevail at the later delivery period by an amount representing the speculator's reward for bearing the risk of price change in the interim. The implication here is that short hedging will predominate, thereby leaving the speculator net long.

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[38] Quoted in Roger W. Gray and David J.S. Rutledge, "The Economics of Commodity Futures Markets: A Survey," *Review of Marketing and Agricultural Economics,* 39, No. 4, 9.

[39] "Backwardation" is a British trade term which in American usage refers to the premium present in an inverted market or a situation in which cash prices exceed futures prices. "Contango," the opposite word, refers to a carrying-charge market in which futures prices exceed cash prices. Thus Keynes considered that risk cost (backwardation) was to be considered "normal" in both kinds of markets, inverse or carry.

In its simplest form the theory predicted that under certain conditions it was necessary, *on the average,* for the price of futures contracts to rise. Early in the development of the theory there were three necessary conditions:

1. Speculators are net long.
2. Speculators are risk avoiders; that is, they require a history of profits if they are to continue to trade.
3. Speculators are unable to forecast prices.

It is clear that all these assumptions can be met if there is a rise, on the average, in futures prices during the life of each contract. It is equally clear that if speculators are net long, require a history of profits to continue the game, and have no ability to forecast the direction or extent of future price changes, then obviously all profits that accrue to them must unambiguously be considered as a reward for the bearing of risk, not unlike the flow of insurance premiums between an insurance company and the insured. The speculator is guaranteed an expectation of gain, on the average, by making it possible for the hedger to hedge. The size of the speculative gain, under these assumptions, hinges *only* on the size of the speculator's position and not on competence.

Statistical Evidence

Stone stated as early as 1901[40] in a report for the U.S. Congress that, among several commodities, an analysis of the cotton markets did not sustain the contention that the futures price is always less than the spot price:

> . . . if, for example, we compare October futures in July with the spot price realized in October. Out of fifty-seven different futures . . . compared with spot prices realized . . . in the N.Y. cotton market from 1881–82 to 1899, in twenty-nine cases the futures proved to be higher than the spots realized 3 months hence, and in twenty-eight cases the futures prices were lower than the spots at maturity—that is, the speculative judgment anticipated the realized value of cotton a little too favorably in half of the cases and not quite favorably enough in the other half . . . in the long run the speculative quotations for future delivery are neither uniformly above nor below the level of the proper cash value of

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[40] *U.S. Industrial Commission Report* (1900–1901), House Doc. 94, 56th Cong., 2d Sess., House, reviewed in Gray and Rutledge, op. cit., 14–15.

> cotton as determined at the future date, but . . . they are tentative anticipations of such realizable value as the conditions of the supply and demand are most likely to determine at the time when the future contract matures.

In the same report results for 15 years (1883–1898) of Chicago wheat prices confirmed that if speculators were to rely on the Keynesian postulate of earning substantial profits by merely running risk and allowing one season's results to be averaged against the others, they would not fare well.[41]

A later report by the Federal Trade Commission[42] introduced evidence on which Working was later to comment[43]:

> One of the most critical and painstaking inquiries into the subject was that made by the Federal Trade Commission. It attacked the problem in several different ways. All the methods produced evidence, in price data subsequent to 1896, of some "downward bias" in futures prices of wheat and corn but not of oats; but for the 10-year period prior to 1896, the indicated bias was in the opposite direction for all grains. The method which the Federal Trade Commission appeared to regard as quantitatively most trustworthy . . . yielded for wheat, 1906–16, the estimate that it amounted to –2.39 cents (about 2.4 percent) for a twelve-month interval.

Early in the controversy considerable doubt was raised that a speculator could amass consistent and substantial profits by merely being net long. In spite of the evidence, it does not seem that the theoretical discussion ever turned to the statistics of the organized markets for confirmation. When other commodities were examined in due course, it became evident that hedgers could be net long for considerable periods of time. The implication that net short hedging would predominate was not always realized. Because the level of the net short positions of hedgers may vary considerably, so will the size of offsetting speculative long positions. Therefore, speculators may possibly have a history of profits *without* prices rising on the average: for example, prices rise 5 cents in the first period and fall 5 cents in the second period; speculators are long 20 contracts in the first period and only 10 con-

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[41] Ibid.

[42] U.S. Federal Trade Commission, *Report on the Grain Trade,* 7 vols. (Washington, D.C., 1920–1926).

[43] Holbrook Working, "Theory of the Inverse Carrying Charge in Futures Markets," *Journal of Future Economics,* **30**, No. 1 (February 1948), 9.

tracts in the second period. Such action is still consistent with the assumed inability of speculators to forecast price changes. The opposite situation may be true also; that is, a rise in prices may not result in profits for traders who are long. Speculators may be long 10 contracts during a price rise of 5 cents and long 30 contracts during a decline of 3 cents.

The arena became packed with clamoring voices, and the ensuing controversy was instructive because it led the academic community to test what traders commonly refer to today as "seasonals." Indeed, if the presence of a trend in a commodity is to be related to the risks of carrying an inventory in that commodity, then any such trend *must* be related to the pattern of hedging.

Cootner has presented several examples[44] in support of the contention that risk premiums can exist in futures. From 1946 to 1974, bimonthly hedging and speculative positions were available for "large traders" as defined by the CEA. Beginning in 1974 exchanges themselves were required to publish volume and open interest information. The CFTC continued to provide a breakdown among hedgers, large speculators, and nonreporting traders, but the breakdown was provided on a monthly basis rather than on the former semimonthly basis.[45] Table 4-3 provides the results of three strategies of initiating long and short positions in wheat futures based on short hedging levels over a 19-year period. All three strategies were profitable for both long and short positions for the period. These results indicate that it was possible for speculators to profit merely by being long after the peak of net short hedging and short after the peak of net long hedging.

Table 4-4 presents some evidence for a seasonal in soybeans. The period covered is from the autumn of 1949 to the autumn of 1960. Details of the strategies are given in the notes for Table 4-4. The long and short strategy keeps the trader long for 6 months and short for almost the same period of time. This strategy offsets what otherwise might be considered an inflationary bias. The average gains for the years 1949 to 1960 are impressive, even though they *omit* the 1960–1961 crop year, which provided about 100 cents profit on the long side and 80 cents profit on the

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[44] Paul Cootner, "Speculation and Hedging," *Food Research Institute Studies*, Supplement, **7** (1967), 84–103.

[45] The reader who wishes to delve further into the area of the grouping of traders might refer to D. J. S. Rutledge, "Estimation of Hedging and Speculative Positions in Futures Markets: An Alternative Approach," *Food Research Institute Studies*, **14** (1977–1978), 205–211, and Ronald W. Ward and Robert M. Bear, "Allocating Nonreported Futures Commitments," *The Journal of Futures Markets*, **3** (1983), 393–401.

TABLE 4-3

Wheat Average Gain per Year, 1947–1965, under Indicated Strategies

Specifications	Strategy I	Strategy II	Strategy III
Cents per bushel:			
Short only	7.8*	8.5*	6.2
Long only	8.6*	9.4*	8.6
Long and short	15.9*	17.9†	14.8
Percentage of price:			
Long and short	7.7	8.7	7.3

Strategy I. Go short at bimonthly point when reported short hedging first drops below 3000 contracts. Cover short sales and go long at bimonthly point when reported short hedging first rises above 3000 contracts. Sell long positions when you go short. All positions are taken in the nearest future in which the position can be held for the entire period.

Strategy II. Same as Strategy I except that all positions are liquidated at the point prior to the change in the balance of hedging.

Strategy III. Same as Strategy I except that all short positions are initially taken in May and are switched to the July future (if necessary) on April 30. Long positions are initially taken in March and switched to May if necessary. Not tested for significance.

* Significant at the 5 percent level.

† Significant at the 1 percent level.

Source: Paul Cootner, "Speculation and Hedging," *Proceedings of a Symposium on Price Effects of Speculation in Organized Commodity Markets, Food Research Institute Studies,* Supplement, 7 (1967), 89.

short. It is interesting to note that the peak in visible supplies is a good proxy for the peak in hedging.

Traders have long considered the possibilities of trading "intermarket" spreads, that is, being simultaneously long and short in different markets in which the impact of hedging comes at different periods of time. One spread is the relation between oats and corn reflected in Table 4-5. The domestic oats crop harvest is started in the spring and frequently lasts through the summer. The corn harvest, on the other hand, begins in September and is usually completed by the onset of winter. For corn, then, short hedging generally increases in the period just before the December contract goes off the board. Oats, during the same period, is a market in which the customary activity is one of hedge lifting. Again, details of the strategies are indicated in the notes for Table 4-5.

The trader should note that strategies 4 and 5 show a much smaller tendency for the price differential to rise because they are computed on a calendar basis rather than on a hedging basis. Thus, although buying two contracts of December oats and selling one contract of December corn on

TABLE 4-4

Soybeans: Average Gain per Year, 1949–1960,* in Cents per Bushel

Positions	Autumn 1949 to Autumn 1960†
Long positions:	
From peak in visible supply to April 30	18.2
From peak in hedging to April 30	21.3
Short positions:	
From April 30 to September 20	14.7
Long and short positions:	
Long from October 20 to April 30 and short from April 30 to September 20	38.7

*Since soybeans were in shorter supply than wheat during this period, long hedging tended to predominate earlier in the crop year than was the case for wheat, even though it is earlier in the soybean crop than in the wheat crop year.

Long positions were always taken in the May future.

Short positions were taken in the September future except in the periods 1949–1950 and 1950–1951, when the September future was not used. In those years the position was taken in the November future.

The September 20 terminal date was near the last day of trading in the September future. The last day was chosen because the long hedging positions in that month are usually taken to protect against late or poor harvests. The harvest usually begins late in September, and the hedging position is generally liquidated very late. It is the late September results which truly indicate the outcome. A smaller but still significant profit is obtained by terminating the short position on August 30.

† All results are significant at the 0.1 percent level.

Source: Paul Cootner, "Speculation and Hedging," *Proceedings of a Symposium on Price Effects of Speculation in Organized Commodity Markets, Food Research Institute Studies,* Supplement, **7** (1967), 97.

a hedging pattern resulted in an average rise of about 5 cents a bushel from 1947 to 1964, a similar strategy on a calendar basis yielded only about 2 cents a bushel. These results tend to support the existence of a risk premium.

Houthakker found, on the basis of monthly price observations, that his sample of speculators actually made money trading futures.[46] These findings required additional changes in the risk premium theory. The trader will remember that the original risk premium concept required that speculators

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[46] H.S. Houthakker, "Can Speculators Forecast Prices?" *Review of Economics and Statistics,* **39,** No. 2 (May 1959), 143–151.

TABLE 4-4

Soybeans: Average Gain per Year, 1949–1960,[*] in Cents per Bushel

Positions	Autumn 1949 to Autumn 1960[†]
Long positions:	
From peak in visible supply to April 30	18.2
From peak in hedging to April 30	21.3
Short positions:	
From April 30 to September 20	14.7
Long and short positions:	
Long from October 20 to April 30 and short from April 30 to September 20	38.7

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[46] H.S. Houthakker, "Can Speculators Forecast Prices?" *Review of Economics and Statistics*, **39**, No. 2 (May 1959), 143–151.

TABLE 4-5

Oats—Corn: Change in Price Differentials of December Contracts, 1947–1964

	Mean Annual Change (Cents per Bushel)	
Strategy*	**To December 15**	**To November 30**
1	4.79[†]	2.67
2	5.62[†]	3.45[‡]
3	3.84[†]	1.67
4[§]	2.37	–1.20
5[§]	–0.54	–1.72

*Hedging-oriented strategies: Buy 2 bushels of December oats and sell 1 bushel of December corn on bimonthly date when

(1) Reported oats net short hedging first exceeds reported corn net short hedging.

(2) Reported oats net short hedging exceeds 2000 contracts.

(3) Reported oats net short hedging minus reported corn net short hedging reaches peak. When oats short hedging always meets the conditions, trades are initiated on April 15.

Calendar strategies: Buy 2 bushels of December oats and sell 1 bushel of December corn on

(4) July 30.

(5) April 15.

[†] Significant at the 5 percent level.

[‡] Significant at the 10 percent level. All other numbers are not statistically different from zero.

[§] The figures are not significant at the 10 percent level.

Source: Paul Cootner, "Speculation and Hedging," *Proceedings of a Symposium on Price Effects of Speculation in Organized Commodity Markets, Food Research Institute Studies,* Supplement, 7 (1967), 100.

(a) be net long,
(b) refuse to trade if they lost money in the long run,
(c) be unable to forecast price changes.

The only price behavior that apparently would tolerate all three conditions was one of rising prices on the average. The first breach in this concept occurred when it was discovered that short hedging did *not* predominate at all times for all futures and that speculators *could still* obtain a risk premium even if prices did not rise on the average. A speculator could simply be net long when hedgers were net short and net short when the hedgers were net long. Houthakker not only indicated that speculators earned profits but also devised a method of estimating the share of profits that should be attributed to actual forecasting skill versus the premium that would be received for merely bearing risk. The insurance premium analogy was no longer adequate in itself to explain speculators' profits. Of course, not everyone accepted these findings. Telser,[47] for one, rejected Houthakker's evidence of the ability to forecast on the basis that commissions were not charged against speculator income, the study was limited to only 9 years (1937–1939 and 1946–1952), and the method of estimating profits and losses was hampered by not including the changes in prices that were available to speculators in each month.

Rockwell enlarged on Houthakker's study in an important analysis covering 7900 semimonthly observations over 25 markets for the 18-year period 1947 to 1965.[48] Among other pertinent inquiries, Rockwell attempted to define the proportion of dollars flowing to speculators that could be attributed to the presence of a risk premium. In other words, how much money would accrue to a naive trader who is long when hedgers are net short and short when hedgers are net long? Two important conclusions emerged. First, prices rose consistently when speculators were net short, causing them considerable losses. Second, the profits that accrue to the naive speculator who is net long are so small that no significant tendency toward normal backwardation is observed. Rockwell pointed out, however, that these conclusions do not imply that there can never be strong upward or downward price tendencies in different markets or in different periods within a market. In other words, even though the overall generalization might be that the futures price is an unbiased estimate of the ultimate spot price, such a statement is critically dependent on the markets which are selected. Those who believe that the concept of normal backwardation is valid may gain some comfort from studies of the relatively highly volatile markets of the 1970s and 1980s. These studies indicated that the risk premium increased during those years. Whether the increase was caused by a change in the markets, a price bias in one direction which would make naive trading easier, or an increase in the wisdom of small traders is not so clear. Whether the increase was enough to overcome the risks and costs of trading is not so clear either.[49]

Rockwell's study is critically important for another reason, however. Although his study indicated rather conclusively that the risk premium

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[47] L. G. Telser, "Futures Trading and the Storage of Cotton and Wheat," *Journal of Political Economy,* **66**, No. 3 (June 1958), 233–255.

[48] Charles Rockwell, "Normal Backwardation, Forecasting and the Returns to Commodity Futures Traders," *Food Research Institute Studies,* Supplement, **7** (1967), 107–130.

[49] See Colin A. Carter, Gordon C. Rausser, and Andrew Schmitz, "Efficient Asset Portfolios and the Theory of Normal Backwardation," *Journal of Political Economy,* **91** (1983), 319–331.

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kets for bran and shorts, fall into disuse and die. The futures market in coffee underlines the kind of pattern that characterizes a thin market. For many years after World War II coffee prices were high by historical standards, and prices for the near future were highest, followed by lower quotations for deferred contracts. This kind of pattern produces rather routine profits for the longs and losses for the shorts. It is interesting to note that in Rockwell's work, cited earlier, the markets with the smallest open interest displayed the largest bias, thus reinforcing Gray's analysis.

Another predictable bias can enter into the futures markets under the influence of a government loan program. Futures prices in wheat, for example, have regularly risen toward the guaranteed loan price, and even though that movement is predictable, it cannot take place until the movement into government hands has occurred. As Gray and Rutledge observe, "So long as the movement into loan is *anticipated,* it would be an irrational price which reflected it, for such a price, incorporating the anticipation, would prevent the event."[51] It is perhaps fitting that the chapter should close as it began, with a description by Working which illustrates the underlying premise of a futures market:

> The idea that a futures market *should* quote different prices for different future dates in accordance with developments anticipated between them cannot be valid when stocks must be carried from one date to another. It involves supposing that the market should act as a *forecasting* agency rather than as a *medium* for rational price formation when it cannot do both. The business of a futures market, so far as it may differ from that of any other, is to anticipate future developments as best it may and to give them due expression in present prices, spot and near futures as well as distant futures.[52]

NOTES FROM A TRADER

The random-walk hypothesis is really a simple theory. It merely says that price changes are unpredictable when only previous price changes, not *all* available information, are used. Those holding that the random-walk model describes reality better than any other model do *not* say that the trader cannot make money—they merely promise the trader the fight of his

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[51] Gray and Rutledge, op cit., 22.

[52] Holbrook Working, "Theory of the Inverse Carrying Charge in Future Markets," *Journal of Farm Economics,* **30**, No. 1 (February 1948), 14.

or her life to beat the naive strategy of buy and hold after paying for the privilege of trying.

The tests that have been published so far lend a great deal of credence to the theory as an excellent "jumping-off point" to explain the short-run behavior of futures prices. This is not to say that all possible strategies have been tested and have failed to provide consistent profits. The ingenuity of traders in this regard has barely been scratched. Most of them feel they have 25 trading rules that will bring them riches beyond the dreams of avarice. But the present state of the statistical art warns, "Don't look around. Something's gaining on you. It's the random-walk theory, the new 'King of the Hill.' "

A stand such as this at the *beginning* of a section devoted to *successful* trading may be considered by many as unadulterated heresy. People make markets, and people do not release cherished falsehoods any more easily in the area of markets than they do in the area of science or philosophy. The fact that "patterns," usually described in an invincibly vague fashion, lead to profits about one-half the time they are traded does not dissuade the user. Instead, the capacity for definition is affirmed, and a new term, "false breakout," is coined. Indeed, the collection of empirical contradictions to any theory, albeit impressive, never succeeds solely by its presence in overturning the theory it contradicts. Rather, it is a better theory that must be advanced, or error simply becomes institutionalized by the collection of reams of "exceptions to the rule."

If short-run price behavior is described crudely by the random-walk hypothesis, then the theory itself becomes fair game. That it sets the tone for the game makes beating it a delicacy, never expected with certainty, yet always savored. The assumption of its tenets sharpens the trader for the battle. The trader *can* win, but only by discovering the truth of the biblical injunction "Broad is the path that leadeth to destruction." Financial salvation is a narrow gate through which pass only those traders who believe very little in luck as the cornerstone of their success. Sooner or later each trader affirms with Damon Runyon that "the race doesn't always go to the swift or the battle to the strong, but that's the way to bet." Indeed, one of the greatest contributions to traders' welfare made by advocates of the random-walk hypothesis is the presentation of objective evidence that shows how difficult it is to make money consistently in the markets.

In moving from trading the markets in the short run to taking positions to profit from expected trends, the trader should realize that the work in this area affirms that, generally speaking, the market does not habitually shower loose dollars on the casual trader who plays the game. As someone remarked, a trader will have to leave his mouth open a long time before a roast pigeon falls in. That there are trends is undeniable. That these trends are easily forecast from factors known at any point in time is an assertion grounded in naïveté. To rely on a bias upward or downward for merely playing the game is to make a risk premium or a characteristic bias the raison d'être of trading. Unfortunately, there is no universal truth about such an assertion. Each trade made with such an assumption must be examined on its own merits and validated meticulously.

The foregoing points up what is perhaps the most important lesson to be learned from the behavior of futures prices. There *has* been serious work done in the field. A bibliography *does* exist, and familiarity with it will pay the trader definable dividends. One of the most rewarding is the ability to think critically about the methodology employed by any one person or institution selling positions in this or that commodity. The methodology at times has a great deal to do with affirming or disclaiming a particular conclusion. The trader should bring a healthy skepticism to the marketplace in the realization that well-trained scholars with a deep and abiding interest in the field do not find it incredibly difficult to disagree with one another. Somehow the vision on the one hand of pockets bulging with easy money and, on the other, the vision of the tip sheet which glibly asserts that sugar is most assuredly on its way up to a 500-point upswing will seem more and more mutually exclusive. To such affirmations the trader aware of the behavior of futures prices will remember to add that even a broken clock is right twice a day and that the capacity of the human mind to resist the intrusion of new knowledge seems close to infinite.

PART TWO

PLAYING THE GAME—TRADING

Armed with an understanding of the basics of the game, the trader is ready to become familiar with the decision-making processes. The seven chapters in this part attempt to isolate, describe, and analyze several elements of successful trading. Successful traders have discovered the importance of sound money management, which is often the least understood and most neglected aspect of trading. For that reason the part begins and ends with considerations that involve the management of funds committed to the futures game.

Chapter 5, "Approaches to Trade Selection: Fundamentals," analyzes those factors that constitute what traders call the fundamental approach. Conceptual supply-demand considerations and applied price-quantity relationships are studied. The often blurred distinction between explaining price changes and forecasting them is presented, as are examples of successful explanatory and forecasting models.

Chapter 6, "Approaches to Trade Selection: Technical Analysis," provides a panorama of technical tracking and forecasting methods in a format that underlines the advantages and disadvantages of each approach. Generous footnoting guides the trader to areas of further market research which may be of interest. From the simple arithmetic bar chart, the trader is led through various systems of price tracking and forecasting, which include trend-following methods, character-of-market approaches, and finally, strategies that focus on market structure and more esoteric systems such as the Elliott wave theory.

Chapter 7, "Spreads," may be considered by some to represent only a choice of futures positions, but the subject is far broader than that and deserves separate and more elaborate treatment. Opportunities in these vehicles are flanked by different risks that must be carefully evaluated.

Chapter 8, "Options," discusses the options markets that have been introduced on several futures contracts. The differences and similarities between options and futures with respect to their risk-reward profiles are considered. The ability of options to limit the risk of an investment due to either price increases or decreases is also discussed.

Chapter 9, "The Game Plan," attacks the problem of the trading plan directly by discussing its elements in some detail. The accent in this chapter is on gathering specific information and organizing it in a format that is useful, regardless of whether the plan accents a fundamental or technical approach. The roles of stops and objectives, as well as mistakes in plan formulation, are analyzed.

Chapter 10, "Money Management," concludes the section by wrestling with the critical problem of money management, which futures traders ignore to their enormous peril. Even if the essential behavior of prices is understood and a rational strategy based on fundamental or technical considerations is formulated and the elements of a successful plan are followed, disaster will still strike if basic skills are not developed in the area of capital management.

5

CHAPTER

Approaches to Trade Selection: Fundamentals

"Say not, 'I have found the truth,' but rather 'I have found a truth.' "

—*Kahlil Gibran*

DECISION MAKING

Introduction

It is popular among traders to conclude that if they provide capital and nerve, it is only necessary to acquire a reliable source of good trades to achieve great success in the futures markets. It is additionally popular to accept as truth several conclusions that are at best questionable but which, in truth, may be useless, fanciful, or downright false. Neither this book nor any other is able to provide all the answers leading to profitable trade selection, but the reader may be well served by the suggestion of some of the more important questions.

Readers who make an effort to supplement what is presented here may be well advised to beware of articulate but biased sources. This is particularly true when such sources justify their conclusions without evidence, with inadequate samples, or with claims of proprietary (undisclosed) methods or results.

Some brokers are customer-oriented, disclose the truth as they know it, make no material omissions of facts, and render honest and efficient service. Others exaggerate, imply market knowledge which may actually be of little or no value, or may indicate trading results for their clienteles or their own accounts which differ markedly from the true results.

Some services, advisers, and account, fund, or pool managers have developed approaches to trading based upon successful experience in enough kinds of markets over long enough periods to justify their efforts to attract trading capital. Others have had limited or narrow experience, which does not justify risking other people's money. Still others conceal or actually misrepresent their experience and trading results.

Some writers for financial magazines and newspapers write scholarly articles about futures which can provide traders with valuable insights and information. Other such writers demonstrate a capacity for writing which vastly exceeds their capacity for thinking. It is not asking too much of writers to support opinions with evidence or to disclose the existence of contrary opinions with equal or greater believability.

There are many reputable people who are engaged in the futures industry in one way or another. Some of them provide information and services of considerable value. Others provide information or services with little, no, or even negative value. Readers are not being advised here to be distrustful or cynical; rather, they are being advised to be alert to the wide range of the quality of advice and service available in the futures industry, investigate before they invest, and try to make certain that their interests are being adequately considered.

The Efficient Market—A Reprise

Whether the markets are efficient and, if so, to what degree has been argued for years. The argument will probably rage forever. The fact that the answer is unknown, however, does not mean that the question should not be faced.

Those who believe that the market is completely efficient are best advised to buy and hold carefully selected portfolios or trade in indexes which act as portfolios. Those who believe that there is efficiency but that it is incomplete should make certain that the information upon which they are basing their trades is valuable, not generally known, and legally acted upon. Those who believe that the market is not efficient at all should be certain that their conclusion is based upon something beyond hope, idle conjecture, or the advice of others which might be based upon self-serving motivations.

The amount of truly scholarly research pointing to strong and possibly complete efficiency is almost overwhelming. Detractors of this conclusion are all too often uttering opinions with insufficient evidence to support their positions or to counter the evidence offered by those with opposing points of view. It is popular to dismiss those who believe in strongly efficient markets either as people who live in ivory towers or as people who tried to profit in the markets, failed, and are trying to explain away their failure.

All those who believe in the efficiency of markets do not live in ivory towers. Some who believe in a market's efficiency have acquired considerable wealth in that same market. Some who most loudly disparage this approach to the nature of markets include those with little or unfavorable experience themselves.

Specific Approaches

It is popular to indicate that there are two general approaches to trade selection: fundamental and technical. This is often followed by an implication that traders tend to select one or the other of these and use it exclusively or predominantly.

Actually, there are more than merely these two approaches. Some traders react primarily to subjective feelings about markets based upon their judgment. Of course, such traders may well be considering factors which others would label as fundamental or technical but which are not specifically identified or quantified. Others rely entirely or partially upon a host of inputs which some may regard as strange, unusual, unreliable, or downright absurd. These can include inputs ranging from the astrological to voices heard in the night. If any esoteric methods work consistently for traders, they are well advised to use them. It should be noted that even the common separation of the fundamental and technical approaches can be called into question. Many fundamentalists are aware of the technical condition of the markets, and many technicians speak of trading only in the direction of the fundamentals.

Despite the blurring of the distinctions between these two approaches to trading and the possibility that one or both are worthless, some discussion of them is warranted.

The Fundamental Approach

The popular distinction between the fundamental and technical approaches to the market has to do with the factors considered or at least emphasized. Fundamentalists are concerned with changes in supply and demand factors which influence the price of the future being traded. Most are concerned with relatively long periods. The technician is concerned primarily with information about the market rather than about the item itself which is being traded. Most, but not all, technicians are more short-term-oriented than are fundamentalists.

In the long run conventional economic wisdom would conclude that the price of a commodity must ultimately reflect the equilibrium point of the combined forces of supply and demand. Isolating, quantifying, and evaluating in some reasonable way the respective weight of each supply-and-demand factor is the primary task of the fundamentalist.

To grasp the magnitude of such a task traders must grapple with economic theory. At this point the inevitable question arises: "Why is theory important? Give me the facts!" There are at least three problems with facts. First, it is not always easy to say exactly what a fact is. A court of law provides an excellent illustration of the effort that must be expended to isolate "facts," especially when different witnesses who appear quite credible and who have believable demeanors contradict one another.

The second trouble with the facts is that the number of them is overwhelming and almost unbelievable. For example, the wheat trader is dealing in a product grown in a huge number of countries. Some of these countries consume most of what they produce; others export varying amounts of their crops depending upon supply and demand conditions. Furthermore, although some countries attempt to distribute information quickly and accurately, others sometimes conceal, withhold, or misrepresent facts. The fundamentalist must attempt to consider human consumption, animal consumption, the amount of wheat to be retained as seed, and the minimum amounts to be carried over as reserves. The supply is based on quantities planted and harvested as well as the yields realized from the harvests. The yields may vary greatly from one region to another and from one crop year to the next. Government programs may affect supply, demand, or both. Import and export restrictions and political considerations may have great effects on prices. The amount of wheat used as feed will depend upon the numbers of creatures which consume the wheat, and so the wheat trader may be concerned with the numbers of cattle and poultry in the world and where they are located. In addition, wheat may compete as feed with corn, rye, oats, soybean meal, and a number of other products, and so the relative prices of all such competitive feeds may well affect the price of wheat. This list is far from complete, and few traders like to specialize in only one market. The number of known facts affecting the supply and demand for wheat available to traders is far beyond their ability to absorb them, regardless of their energy levels or organizing skills. When the number of unknown facts about wheat which can affect price is added, the total becomes completely unmanageable. To consider additionally other markets equally or even more complex, such as currencies, silver, or stock indexes, makes the problem mind-boggling. Simplification of reality by the development of models becomes a necessity, but creates the risk of omitting or weighting too lightly a seemingly minor factor which may well prove to be the dominant factor during the very period being considered.

The third trouble with facts is that the individual trader seldom can know in advance the degree to which a particular set of emerging facts has been expected (discounted). Many disappointed traders have puzzled over markets that opened lower following news that they believed would have to be considered to be bullish or markets that opened higher following news that they would have believed to be bearish.

The fundamentalist is confronted not only with a long list of factual relationships but also with the compound relationships described by that demanding gossamer prefix "expected." Hence the multiplicity of relationships increases dramatically. The soybean analyst must double the broad inputs of carry-over, new-crop production, and imports to *expected* carry-over, *expected* new-crop production, and *expected* imports. Whereas the fundamentalist might appear to be required to reason as well as possible concerning the combinational change that could occur among three dominant variables, it is actually necessary to consider six variables, with the ensuing proliferation of possible outcomes. Demand for soybeans explodes from an analysis that includes the demand for oil and meal, the amount of beans crushed, and exports into the *expected* demand for oil and meal, the *expected* demand for meal, the *expected* crush of beans, and the *expected* export figure.

The soybean trader who is trying to compress price prediction by considering only a simple relationship of the anticipated size of the new crop to the size of the old crop is faced by the following bewildering set of possibilities added to the problems of acquiring accurate data, which may or may not have predictive value:

A large crop follows a large crop when either, both, or neither was expected.

A large crop follows a small crop when either, both, or neither was expected.

A small crop follows a large crop when either, both, or neither was expected.

A small crop follows a small crop when either, both, or neither was expected.

A small carry-over or large carry-over precedes any of the foregoing combinations.

Successful traders must understand and give meaning to the relevant facts about a future and determine which of these facts are likely to dominate prices during the period being observed. In doing so the traders must theorize. There are those who attempt improperly to draw a contrast between theory and facts. The proper contrast is not between theory and facts. The proper contrast is between good (useful) theory and bad (irrelevant) theory. Good theory should lead to good practice. If theory does not do this, it is simply not good theory.

Traders who wish to understand why prices are what they are or what factors might cause prices to change materially must become familiar with the forces that affect supply and demand and the possible significance of the effects. Traders working toward developing a model that explains prices should also be aware, however, that a model that explains prices is not necessarily a model that predicts which factors will change, and in what proportions, or what the market effects of the changes will be. In brief, a highly skilled fundamentalist may have a thorough understanding of a market's structure but still have no information that will lead to the profitable establishment of market positions.

The advent of inexpensive computer capacity, more sophisticated software, and increasing skills among users has resulted in increased efforts being made to analyze market fundamentals. Unfortunately, however, the ability to analyze and digest information quickly might serve only to make markets even more efficient and profits, therefore, even more difficult to realize. Regardless of all these and other intricacies involved, the fundamentalist trader's estimate of future price action must rest on an explicit or implicit theoretical base. Such a base must include the dynamics of price equilibrium, which in turn considers the nature of the various supply and demand curves, including the elasticity of each, and the response of all material factors to changes in the others.

Although equilibrium is a meaningful concept for referring to the direction of the long-term forces working on price and quantity changes, it should be noted that disequilibrium is the normal condition of a trading market. In that the demand for many commodities can change much more quickly than the supply, adjustments may require long periods. For example, much of the cocoa crop is still grown by small farmers in Ghana and Nigeria. The price of cocoa for a period of 2 or 3 years affects the quantity of beans supplied in the following periods. If cocoa prices are high during one period, the farmers will be financially able to expand planting or, equally important, able to afford insecticides and fertilizers to ensure a greater yield from the trees they have. As greater yields are realized, prices drop, expenses are cut, and the cycle is slowly reversed. Similar conditions exist in other markets such as sugar and livestock.

Model Building

It is possible to construct a flowchart of an industry which illustrates the magnitude of the forces that affect the price of a particular commodity at any particular time. These relationships include hundreds of variables, some of which are quantifiable to some degree. Theoretically, if the flowchart is correct and all the factors that affect the price of the commodity have been included and weighted according to their importance, a mathematical formula might be produced to explain the average price of the commodity for each period being considered.

Because such an exercise would require many years of preparation if it could be done at all, simplification of these relationships is necessary. This simplification, known as *model building*, attempts to reduce the number of variables from that approaching the infinite to a few dominant factors that retain the power to explain.

Once a market has been selected for fundamental study, the following step-by-step method can be employed[1]:

1. *Read background material.* The first step in any analysis must be a familiarization with the chosen market. Before beginning, an analyst must have a good idea of the fundamentals that affect the market, as well as the primary sources of statistical

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[1] Adapted from Jack D. Schwager, *Schwager on Futures: Fundamental Analysis.* New York: John Wiley & Sons, 1995, pp. 216–219. Used by permission.

information. Sources should include both books and articles. The Internet is an excellent place to acquire information.

2. *Gather statistics.* Once a good understanding of the basic mechanics of a market has been established, list all the statistics that might be relevant in formulating a price analysis. The U.S. Department of Agriculture (USDA), which publishes a wide variety of reports on domestic and foreign agricultural products, is an excellent source of information. Another major source of statistics is the *Commodity Research Yearbook,* which contains statistical summary tables on most tradable commodities.
3. *Deflate price data.* This is an essential step in all fundamental price forecasting. Futures prices are typically adjusted using the Producer Price Index, which will enable the analysis to isolate a market's true price independent of general trends in inflation.
4. *Construct a model.* Select one or more approaches to relate the variables found in step 2 to the general trend of price history. Some of the more popular methods include regression analysis and econometric modeling, both of which use techniques to find the relationship between dependent variables (the statistics found in step 2) to the independent variable (the price history created in step 3).[2]
5. *Modify the model.* After identifying which past years, or seasons, failed to fit the general pattern, try to determine the factors that were responsible for the aberrant behavior. Attempt to incorporate these factors into the general model. In some cases, highly unusual price action in a past year might reflect the impact of isolated events (i.e., price controls, export embargoes, etc.) that are not relevant to the current market. In such situations, it is often preferable to delete the abnormal year from the model.
6. *Estimate the independent variables.* The independent variables are the factors used to explain and forecast prices in the model. These inputs must be estimated for the forecast period. For example, the coming season's corn crop, which would obviously be a key input in any corn price–forecasting model, could be estimated on the basis of planting intentions, historical yields, and weather conditions to date.
7. *Forecast a price range.* Allowing for a plausible range of values for each of the independent variables, use the model to forecast

a price range for the upcoming period. This range must then be converted into current dollar terms by multiplying projected prices by the index used to deflate prices in step 3.

8. *Evaluate the potential impact of government regulations.* Consider if existing government programs are likely to interfere with the normal free market mechanism. For example, is the loan level likely to become a price-supporting factor?
9. *Assess the trade opportunity.* Compare the potential price range implied by the foregoing analytic steps with the prevailing price level. A trading opportunity is indicated only if the current price is significantly outside the current range.

Explaining versus Forecasting

The trader should be clearly aware of the significant differences in meaning and value between explanatory and forecasting models. Building a model merely to explain the elements that enter into price can be enormously difficult. Building a model that predicts with significant accuracy where prices are going to go is at a minimum far more complex and might well be impossible. One of the most insistent myths surrounding fundamental analysis in futures is that *explaining* price changes is equivalent to *forecasting* price changes. On the contrary, an explanation is seldom equivalent to a prediction. In fact, explanation frequently requires only that the trader be equipped with 20/20 hindsight.

In an explanatory model the variables used to explain a price at a particular time are also measured at the same time and thus must be currently available with the price they seek to explain. For example, assume that the trader has found that the price of hogs is a function of the quantity of hogs available, the prices of substitutes (beef and veal, lamb and mutton, fish and poultry), the income position of buyers, and consumer preference and that no further variables are needed to explain past prices. Assume further that the proper quantities for all past years are absolutely known for all four of these variables and that they have been weighted properly. As magnificent as such a model of price behavior would be, it would enable the trader only to *understand* past hog prices, not to *predict* future hog prices. The problem of turning explanatory variables into forecasting variables would still remain. For example, one determinant of the price for hogs—the quantity of hogs available—is reported quarterly in December, March, June, and September. Unfortunately, no one has yet been able to forecast consistently the quantity of hogs before these reports are issued. If, as already discussed, the behavior of futures prices is based partly on *expectations* and *changes* in expectations, it becomes a formidable task to predict price changes even if the trader were given a perfect preview of the figures to be reported. Unless the trader were also privy to accurate estimates of what figures were *expected,* he or she might still be unable to forecast the price changes that might follow the input of new information.

On the other hand, there are really only two general ways in which a *forecasting* model can be built. The first approach, using the preceding example, is to forecast the *next* hog quantity from a knowledge of past hog quantities. This simple extrapolative technique would have proven worth only if the explanatory variable, lagged for one 3-month period, were found to have predictive value when estimating the quantity of hogs in the next report. For example, assume for a moment that the trader has access to 10 years of figures reflecting the quantity of hogs available as evidenced by the annual December report. It is now March, and the trader wishes to forecast accurately the March quantity-of-hogs figure soon to be released. If the only source of information is the December hog quantity figure, the trader has an *explanatory* variable lagged by 3 months. If the pattern of December figures offers a significant clue over the years to the upcoming March figure, the trader can use this lagged explanatory variable to *predict* future variables. The published material to date, however, does not give the trader much encouragement in this regard.

The second method of forecasting isolates a variable that is predictive of hog quantities apart from past hog quantity figures. For example, the trader may find that quarterly changes in hog quantities are related to changes in the price of beef. However, for this information to be of forecasting, rather than explanatory, value, the price of beef in the *present* period would have to correlate highly with the quantity of hogs available in a *future* period. Again, research indicates that this approach to forecasting does not easily yield significant results.

Keys to Better Forecasting

The bridge from explaining past price changes to forecasting future price changes is not easily crossed. Many traders are sure that someone, somewhere, knows everything, in that this person is knowledgeable enough to list all the sets of supply and demand conditions that would cause *all* bull or bear markets. In reality, traders do extremely well to isolate, quantify, and evaluate any set of conditions *sufficient* to cause a particular bull or bear market, even if viewed retrospectively. The development of a forecasting model requires even more rigor.

There is no requirement that traders be omniscient in order to make money. It is enough that they isolate and quantify any set of sufficient conditions for bull and bear markets in the futures they are trading. Traders following this strategy will simply not trade a future (regardless of its price fluctuations, all of which are caused by sufficient conditions of which they are unaware) until they see the sufficient conditions they have previously validated materialize. Then, and only then, will the traders take a position in the market.

Such a strategy is similar to that which might be followed by someone paid to predict fires. He might miss a great many fires caused by, say, chemical combinations of which he was completely unaware, but the specific knowledge that rags soaked with flammable fluids usually combust might be enough to earn him a generous living.

The fundamentalist attempting to build a forecasting model by searching for the factors that will dominate a current market might find insurmountable the problems to be solved. Some traders begin to feel comfortable with traditional supply-demand analysis just in time to lose most of their capital in one trade because a price which can go no lower or no higher finds a way to do so and perhaps by a considerable amount. Such traders find out too late that the supply coming into a market does not always decrease when the price falls. In fact, the fear of a further fall in price may be an inducement to offer an even greater supply on the market, thus causing price to weaken beyond the point that was indicated by traditional equilibrium analysis. The same possibility exists on the demand side, where the fear of a further price rise may induce a tremendous demand in the short run which can outstrip all economic projections and account for many a tragic tale of getting short "too soon." The inapplicability to the trader of "equilibrium" prices in the short run is reflected by rather substantial totals in the loss column each year. There are traders who remember when the price of soybeans was considered unbelievably high when it exceeded $4 per bushel. Others believed that world sugar could not possibly sell much below 15 cents per pound for long because that was "its cost of production." And who would have believed that the price of a contract of onions would ultimately fall to the price of the burlap bags in which the onions were shipped?

The significance of information is difficult to evaluate. As time passes, new information appears which must be considered. Some information must be selected from the mass available in order to develop a manageable model. The model must incorporate expectations as well as statistical data. New information and its impact are unpredictable. The random quality of new information rather than actual changes in supply and demand is responsible for the disequilibrium which is usually the norm in futures prices.

Prices might be related to quantities other than carry-over, production, imports, exports, usage, government monetary and fiscal policies, and the myriad of other factors which influence futures prices "fundamentally." The relationships of price to volume, open interest, and forces of speculation and hedging may also be considered in the search for explanatory and predictive variables. It is little wonder that some battered and discouraged fundamentalists may try other approaches to trade selection. Some believe that from experience they have developed such a finely honed sense of judgment that they can simply observe a market and "know" that the level of prices is too high or too low. Most such traders find that the market is a more formidable opponent than they had thought, and eventually they are leveled along with the prices. Others, however, actually do seem to sense when a market is "tired" and ready to fall or is poised for an upturn. Traders with this ability may have developed or been born with specialized sensitivity or judgment beyond that of other less fortunate mortals. Perhaps trading, like chess or operatic singing, can usually be learned only to a point beyond which most people cannot go because of the lack of some natural endowment.

Still other fundamentalists crushed by the sheer weight of elusive and mercurial data may find it satisfying to conclude that all fundamental data are reflected quickly and accurately in trading statistics anyhow, and they thereby feel justified in turning toward the less bewildering world of technical analysis.

NOTES FROM A TRADER

It is not the purpose here to indicate that fundamental analysis is a waste of time. Knowing what factors influence supply or demand for a future and to what degree might well alert a knowledgeable and observant trader to changes taking place in a market which might yield handsome profits. Rather it is the purpose to make clear that there is much more to such analysis than reading or hearing about a government report or political development and then expecting a market to wait for a leisurely entrance at a favorable price level. Most roads to high economic returns are marked by several rocky detours along the way.

Basic Data

Errors in basic data will obviously lead to errors in forecasts. The trader must realize that every statistic; whether generated by government or private sources, has a band of error about it. There are many problems in specifying what factors influence prices and how and when to measure them. Masses of data are meaningless unless they are grouped in some manner; however, there is the problem of the most representative totals or averages for various markets, seasons, or time periods.

No matter how accurate the estimate of a crop size, for example, may be, that estimate is based on a sample. Samples are less than perfect reflections of reality for many reasons, the most important of which is cost. At some point the return in the form of increased accuracy is not so great as the increased cost. The trader should remember that accuracy is also impaired because of revisions to data that are constantly being made. The words "preliminary" and "estimate" liberally dot most factual summaries.

The Analytical Framework

Even though there are no substitutes for competent statistical tools in the process of appraising the outlook for prices, the trader must bear in mind that such tools are not reliable substitutes for judgment. Because judgment is present continually, it can be extremely difficult to reproduce, on a quantifiable basis, fundamental studies performed at a particular point in time. As one study concluded, when referring to the estimation of certain variables in the pork bellies market, the procedure used "was not systematic, was not documented, and could not be duplicated."[2]

An important source of error is in the construction of the model itself. Explanatory models attempt to specify historical price responses to supply-demand forces which involve a complicated set of varying leads and lags. Forecasting models bear the additional burden of having to lead actual price response. Because models are but a simplification of reality, no model can include all the relevant factors. A second source of error may

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[2] Vance L. Nimrod and Richard S. Bower, "Commodities and Computers," *Journal of Financial and Quantitative Analysis,* **2**, No. 1 (March 1967), 64.

be the choice of equation form. Some relationships are linear, whereas others are curvilinear and may be more difficult to identify. Some relationships may best be studied in terms of changes rather than levels. Finally, estimates of elasticity are subject to a range of error which may arise from inaccurate basic data or a poorly constructed model.

Opportunity Cost of Capital

Traders employing the fundamental approach are not concerned so much with the question of *when* prices will move significantly up or down as they are with the probability of *whether* prices will move in a given direction and the possible extent of such a move. If prices move immediately through the objective indicated by a trader's study, the trade presents no hazard. However, if prices move opposite to the trader's expectation, the trader is confronted with the vexing problem of losses or, at least, forgone alternative opportunities. If such action persists for months and other trades are rejected because capital has been unavailable for commitment, the cost of capital becomes a real consideration.

Increased Market Efficiency

Implicit in the fundamental approach is the search for the discrepancy between the actual price of a future and its intrinsic value, as indicated by the price model formulated. As information systems become more complex and computer capability becomes more accessible, it seems logical to predict a damping effect on the quantity and degree of discrepancy that a given market will allow to remain unexploited.

It will be remembered that the concept of an efficient market is implicit in the random-walk model developed in Chapter 4. The implications of this model for the fundamentalist are clear. The closing price of a future for any one day or month is generally as good a clue as any fundamental factor to the closing price on the following day, week, or month. If the full import of such a truth dawns on a trader with something less than instant clarity, the trader may be comforted to learn that a sage observer of futures markets for many years has wryly observed:

> It is remarkable how long a known fact can in effect remain unknown, for lack of sufficient thoughtful attention to it; the near randomness of speculative price movements has long been widely recognized, in the limited form

of recognition that no simple method was known for reliable prediction of speculative price movements.[3]

At least one study has documented the fact that futures prices are almost as active when markets are closed as they are during formal market hours[4]; that is, prices vary almost as much overnight and over any weekend as they do during the actual trading period. Such continuation of activity underscores the never-ending search by traders for new information. It seems that expectations never sleep. (Given the trend toward 24-hour markets by linkups among American, European, and Far Eastern cities, perhaps analysts and traders will also have to forgo sleep.) Prices are pulled inexorably toward events that are unknown but about to transpire. Indeed, on those plains of expectations bleach the bones of countless traders who insist that in the short run there must be a significant correlation between basic market factors and prices.

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[3] Holbrook Working, "Tests of a Theory Concerning Floor Trading on Commodity Exchanges," *Proceedings of a Symposium on Price Effects of Speculation in Organized Commodity Markets, Food Research Institute Studies,* Supplement, **7** (1967), 14.

[4] Walter Labys and C. W. J. Granger, *Speculation, Hedging, and Commodity Price Forecasts* (Lexington, Mass.: D.C. Heath and Co., 1970), pp. 81–82.

6
CHAPTER

Approaches to Trade Selection: Technical Analysis

"Folly is often more cruel in the consequence than malice can be in the intent."

—*Lord Halifax*

INTRODUCTION

Technical analysis refers to a study of the market itself rather than of the external factors that affect the supply of and demand for the various commodities, currencies, financial instruments, and other items which are traded in the futures markets. Technicians utilize the statistics generated by the markets. By tracking and smoothing these data, the technicians attempt to describe and explain short-term price movements. Those who rely on their judgment to make trading decisions may use technical devices to enhance their judgment.

Other technicians go further. They believe that past actions of the market alone may be utilized to reach meaningful conclusions about future prices; that is, the way the market behaved yesterday may indicate how prices will behave today. Such technicians, of course, reject even the weak-form explanation of market efficiency and dismiss the random walk. Research into this area is attributed, as usual, to naive academicians or traders who simply do not really understand markets. Technicians typically do not believe that price fluctuations are random and unpredictable. They believe that the study of transactions taking place can help traders anticipate impending price movements with sufficient accuracy so that they realize an adequate rate of return to cover any effort expended or risk accepted.

The fundamentalist reasons inductively, seeking to isolate and quantify dominant factors. By taking into consideration the expected supply and expected usage of products underlying futures, including such factors as carry-in, carry-out, production, exports, free supplies, substitutability, money supply, trade balances, and a host of others, fundamentalists try to deduce intrinsic value. If current prices indicate that the market is sufficiently above or below presumed equilibrium levels, appropriate action is taken in the futures market.

Some technicians consider their version of fundamentals but prefer to emphasize technical devices. Others go further and contend that fundamental analysis is a completely futile procedure. They point to many of the problems faced by fundamentalists. The factors the fundamentalist is examining are in many cases estimates subject to important revision. Furthermore, the technician asserts that there are so many fundamental elements in play at any time that an important one can often be overlooked or those being analyzed may be weighted improperly. Even if all relevant supply-demand factors can be estimated with total accuracy, the technical analyst still believes that the result would be of only limited value in appraising prices. As two advocates of the technical school declare[1]:

> Of course, the statistics which the fundamentalists study play a part in the supply-demand equation—that is freely admitted. But there are many other factors affecting it. The marketplace reflects not only the differing value opinions of many orthodox (commodity) appraisers, but also all of the hopes and fears and guesses and moods, rational and irrational, of hundreds of potential buyers and sellers, as well as their needs and resources—in total, factors which defy analysis and for which no statistics are obtainable—In brief, the going price as established by the market itself comprehends all the fundamental information which the statistical analysts can

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[1] Robert D. Edwards and John Magee, *Technical Analysis of Stock Trends* (Springfield, Mass.: John Magee, Inc., 1957).

> hope to learn (plus some which is perhaps secret from him, known only to a few insiders) and much else besides of equal or even greater importance.

A recent study found that approximately 90 percent of chief foreign exchange dealers surveyed in the London foreign exchange market (the world's largest FX market) used some technical model input to help formulate their outlook for exchange rates over short-run periods, particularly for intraday to 1-week horizons.[2] These rank among the largest and most sophisticated market participants.

Every technical approach, from the simplest to the most complex and esoteric, falls into one of four broad areas of technical analysis: patterns on price charts, trend-following methods, character-of-market analysis, and structural theories. Volumes could be—and have been—written about many of the methods contained in these four basic areas. To go into great detail on any one method would be beyond the scope of this book, but a comprehensive survey is presented, with ample references for further study of the key methods within each area.

PATTERNS ON PRICE CHARTS

The use of patterns of movement on price charts is one of the oldest methods of market analysis known. The approach is said to have gained great popularity in 1901 when William Peter Hamilton, then editor of *The Wall Street Journal,* stunned his readers by recounting in detail precisely what James R. Keene was doing when he successfully promoted the first public offering of stock in U.S. Steel. Hamilton was said to have had an informant in Keene's inner circle, and Keene himself believed this. *The Wall Street Journal* readers were amazed to learn that all of Hamilton's deductions were made by simply tabulating—and shrewdly analyzing—the price and volume action of U.S. Steel stock on the market.[3]

Although Hamilton used only common sense in analyzing the price movement of U.S. Steel, it was not long before many other researchers attempted to catalog and codify any number of price patterns with supposed forecasting value. At first it was said that the "pools" (secret groups of

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[2] Michael R. Rosenberg, *Currency Forecasting* (Chicago: Irwin Professional Publishing, 1996), pp. 326–327.

[3] William Peter Hamilton, *The Stock Market Barometer* (New York: Harper & Brothers, 1922). Hamilton explained in some detail the kind of reasoning he used in his deductions. Hamilton's exposition of the basic premises employed in technical analysis remains one of the best available, even after more than half a century.

wealthy speculators who manipulated stock prices) revealed their actions to the trader who charted prices and volume. In later years, when the pools were banished by legislative fiat, the charts were supposed to show "changes in psychology." Whatever one believes is being measured, this entire approach rests on the assumption that certain repetitive patterns of price and volume action will often occur before significant price movement.

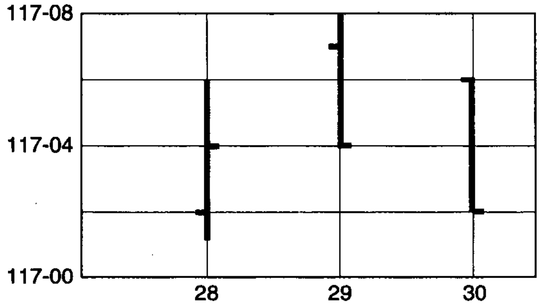
Bar Charts

The most popular tool for storing price and volume history in searching for these repetitive patterns is the bar chart. In standard procedure each day (week, month, or year) is represented by one vertical bar on a graph. The bar is drawn to cover the range between the high and low prices of the day, with a "tick mark" indicating the opening and closing prices. This is illustrated in Figure 6-1, which shows the price chart of wheat with the lower bar showing the trading volume. Each day is plotted to the right of all preceding days until a record of prices is compiled.

As traders analyze price action, they frequently notice recurring price patterns. Figure 6-2 shows a number of patterns that have been well

FIGURE 6-1

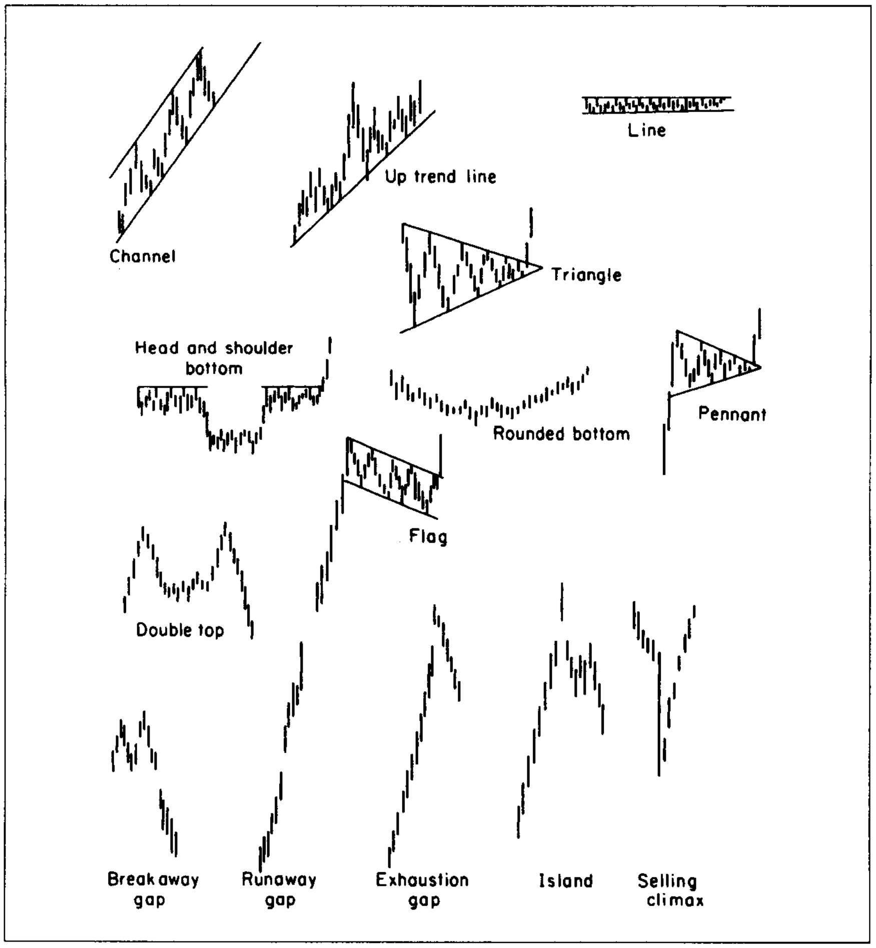
Constructing a bar chart.



	28	29	30
Open	117-02	117-07	117-06
High	117-06	117-08	117-06
Low	117-01	117-04	117-02
Close	117-04	117-04	117-02

FIGURE 6–2

Typical chart patterns. The mirror image of most of these patterns has an opposite implication.



documented. Patterns can be divided into two types. *Continuation patterns* (channel lines, pennants, etc.) are thought to indicate that the current price action (i.e., an uptrend or downtrend) is likely to continue. *Reversal patterns* (heads and shoulders, tops and bottoms, exhaustion gaps, etc.) supposedly portend a potentially important change in trend. Fortunately for the trader, positions do not have to be taken on blind faith. Numerous software programs can "test" the validity of price patterns (among other technical devices), and futures price data are available for a nominal charge. Several well-written books on pattern trading are also available.[4]

Point-and-Figure Charts

Point-and-figure chartists make two assumptions that bar chartists do not. First, they view the volume of trading as unimportant, a mere side effect of price action with no significance. Second, they dismiss the importance of how much time has elapsed as price moves from one level to another. Only one thing matters, and that is the direction of price change. Point-and-figure charts are constructed to show the direction of price change and nothing else.

Figure 6-3 illustrates a typical point-and-figure chart for cocoa. The chartist had decided in advance to smooth price action broadly by indicating every fluctuation of $20 or more and has scaled the chart accordingly. Each box on the chart equals $20.

If the price of cocoa rises by $20, an "X" is used to indicate the price change. As long as the price of cocoa continues to rise, new X's will be entered on top of those preceding, one for each $20 of rise. If the price of cocoa rises by $300 with no interruption of as much as $20, 15 X's will be placed on top of one another in the same column. This will continue until the price drops by the minimum amount decided upon previously, in this case $20. Once this happens, an "O"[5] is placed in the column to the right. Each additional $20 drop causes an "O" to be placed below the preceding "O" as long as the price continues down with no $20 interruption. When a $20 rise finally occurs, an "X" is placed in the next column to the right, and the sequence continues as prices dictate.

The P & F chart is a record of price reversals with no reference to time. For comparison purposes a weekly chart of cocoa for the same period is shown in the lower half of Figure 6-3. The closing price for each week is blacked in on the chart to make the comparison easier. Clearly, the more often the price of cocoa reverses direction by $20, the greater the number of vertical columns used up.[6]

Any amount of price fluctuation can be shown on a point-and-figure chart. A chartist with an extremely short-term orientation and access to all

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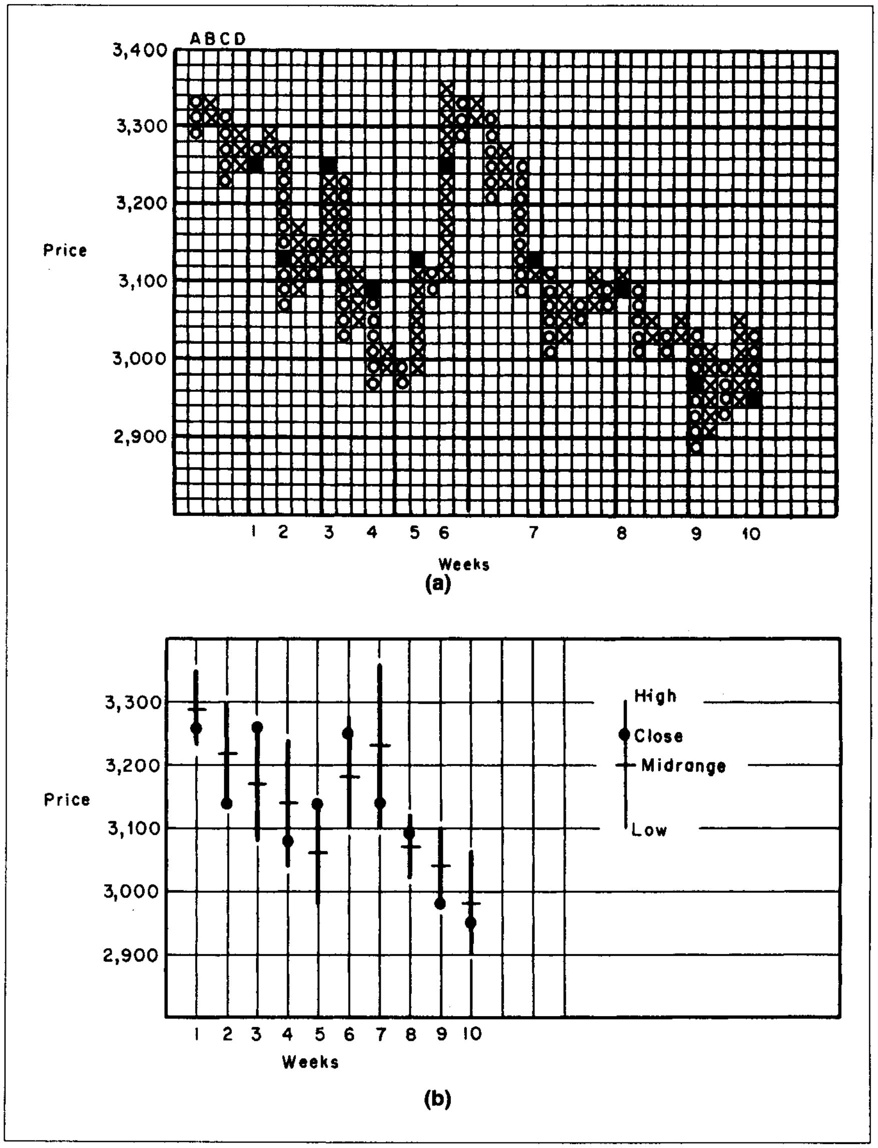
[4] A list of software available to the technical analyst and books on the subject are listed in Chapter 17.

[5] Some technicians will use an "X" in both up and down columns of price movement.

[6] The two standard works on the interpretation of point-and-figure charts are Alexander Wheelan, *Study Helps in Point and Figure Technique* (New York: Morgan, Rogers and Roberts, 1962), and A. W. Cohen, *The Chartcraft Method of Point & Figure Trading* (Larchmont, N.Y.: Chartcraft, 1960).

FIGURE 6–3

Point-and-figure chart versus bar chart. (*a*) Point-and-figure chart for a 10-week period in cocoa: each X or O represents a change of $20; (*b*) bar chart for cocoa covering the same 10 weeks as (*a*).



successive prices during the day could construct a chart to show reversals of as little as one minimum fluctuation. A single day's action could use up scores of columns. On the other hand, a trader with an unusually long-run view could construct a chart to show reversals of no less than 30 or 40 points. With such a large unit of reversal a considerable history of price fluctuation could be compacted into a small chart, but some traders would consider the amount of information too sparse to be sufficiently informative.

Despite their unique construction, point-and-figure charts are used much like bar charts.[7,8] Figure 6-4 illustrates many of the popular bar-chart patterns in a point-and-figure format. The most important difference in claims made for these two tools for charting, and perhaps the only substantive difference, is that many chartists believe that the *extent* of future price moves can be predicted by using point-and-figure charts. This is accomplished by a consideration of what is known as "the count."

In its simplest form the count is the number of squares across an area of lateral movement on a point-and-figure chart. Chartists who use the count believe that a direct relation exists between the number of squares used up during a lateral movement and the size of a subsequent rise or fall out of this congestion area. There are several variations on precisely how to use the count to project the extent of the future move.[9]

Striking the Balance—Advantages and Disadvantages of Using Price Patterns in Trading

The Advantages

(*a*) Publicly available trading software can be used to quantify the efficacy of using patterns, turning what once was a purely discretionary method into a more quantifiable endeavor. (*b*) It cannot be denied that successful analysts, past and present, have used price-pattern concepts successfully.

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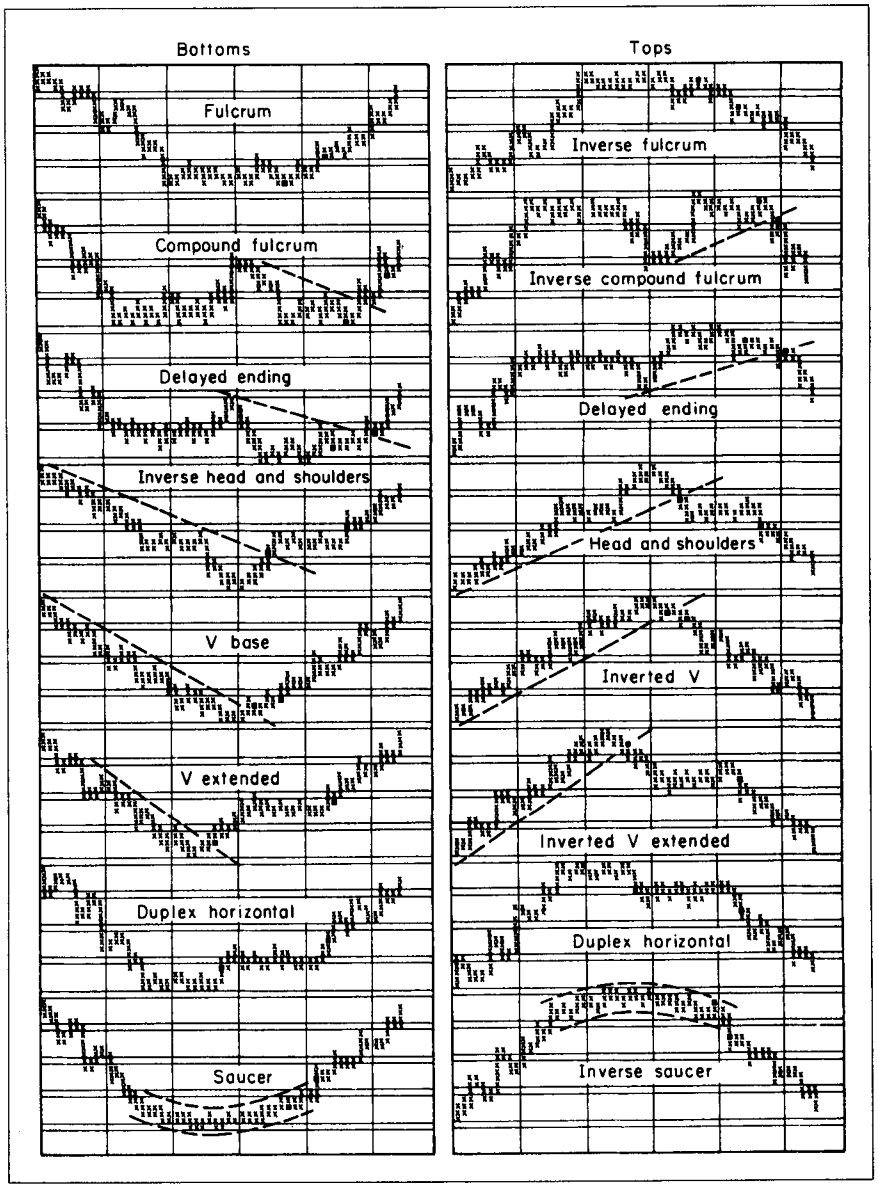
[7] The first published work on point-and-figure charts is Victor De Villers, *The Point & Figure Method of Anticipating Stock Price Movements* (New York: Traders Press, 1972). This book shows how importantly De Villers was influenced by the Dow theory and other classical technical concepts.

[8] An exceptionally intricate theoretical rationale of the use of point-and-figure charting is presented in John W. Schulz, *The Intelligent Chartist* (New York: WRSM Financial Service Corp., 1962).

[9] Wheelan, loc. cit.; Cohen, loc. cit.; and Schulz, loc. cit., all present several variations of "the count" in point-and-figure charts. An ardent point-and-figure chartist who believes that the projection of price targets is a worthless pastime is James Dines, *How the Average Investor Can Use Technical Analysis for Stock Profits* (New York: Dines Chart Corp., 1972). Dines's book contains several variations on basic point-and-figure techniques.

FIGURE 6-4

Examples of patterns of point-and-figure charts.



Although studies on the accuracy of chartists' forecasting have yielded disappointing results, they have also unearthed the occasional practitioner who has achieved substantially successful results over a long period of time. Individuals making successful forecasts from this kind of analysis are not unknown, though they are, admittedly, few. (*c*) Even if the use of any specific price patterns for forecasting purposes is considered unacceptable, it is nevertheless true that a study of price charts can reveal information about market action that may assist the trader in making a decision. For instance, a trader contemplating the purchase of two different commodities might well use a different operating plan in a commodity whose chart showed a steady descent to ever lower levels, as opposed to another whose chart showed prices soaring to record highs.

The Disadvantages

(*a*) The use of most chart patterns has been widely publicized in the last several years. Many traders are quite familiar with these patterns and often act on them in concert. This creates a "self-fulfilling prophecy," as waves of buying or selling are created in response to "bullish" or "bearish" patterns. After this chartist buying or selling is exhausted, prices will very often reverse direction to create vicious "chart traps." Just as positive or negative fundamental information can be discounted in the prices, so can positive or negative technical information be discounted. (*b*) The few analyses done to date of the records of the chartists themselves have not been encouraging. Chart-oriented advisers have, in almost all cases, given advice that was no better than random. Even with the few who have distinguished themselves, there is no evidence that their success rests solely in chart reading. It is safe to assume that whatever predictive value there may be in price patterns is not easily comprehended.[10]

TREND-FOLLOWING METHODS

Isaac Newton can be given credit for probably the best-known assumption on which most technicians operate: "A price trend once established is more likely to continue than to reverse." This is simply a restatement of Newton's first law of motion, applied to price action. If this concept is

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[10] For a cynical view of any successful trader, see Fred Schwed, Jr., *Where Are the Customers' Yachts?* (Springfield, Mass.: John Magee, Inc., 1955), Space Age Edition, in the chapter entitled "A Brief Excursion into Probabilities."

accepted as true, then a successful trading strategy can be built on the simple principle of buying strength and selling weakness. The only problem remaining is the optimum way in which to carry it out.

Moving Averages

An average is defined as "the quotient of any sum divided by the number of its terms." Thus a 10-day average of soybean closing prices is the sum of the last 10 days' closings divided by 10. A moving average of prices is a progressive average in which the divisor number of items remains the same, but at periodic intervals (usually daily or weekly) a new item is added to the end of the series as, simultaneously, an item is dropped from the beginning.

If one is constructing a 10-day moving average of soybean closes, the average on the tenth day is the sum of days 1 through 10 divided by 10. On the eleventh day the eleventh day's close is added to the total and the close of day 1 is subtracted. This new sum is then divided by 10. On day 12 the close of that day is added to the total and the close of day 2 is subtracted. This total is divided by 10, and so on. Table 6-1 illustrates the computation of a 10-day moving average based on the closing prices of wheat.

Figure 6-5 shows a 10-week moving average of soybean closes. An examination of this chart will reveal the important properties of moving averages. The 10-week moving average smooths out the erratic week-to-week changes in actual prices and thereby indicates the underlying trend. Further, the moving average lags behind prices and crosses the current price only when a new direction is established. These same properties are characteristic of moving averages calculated for any time span.

Shown on the chart are "buy" and "sell" signals, given when price penetrates the 10-week moving average. Technicians acting on such signals are following the strategy of buying strength and selling weakness.

They hope that a prevailing trend, like the one at the beginning of 1997, will continue long enough to compensate for the kinds of whipsaw losses that occurred in May and June of that year.

There are countless systems that use moving averages, but all are based on variations of just two factors:

1. The length of time used in computing the moving average. It is here that an important trade-off is involved. The shorter the length of time, the more sensitive the moving average will be to

TABLE 6-1

Computation of a 10-Day Moving Average for a Typical Wheat Contract

Date	Close, in cents	10-day net change[*]	10-day total[†]	10-day average[‡]
3/15	290.000			
16	291.500			
17	294.000			
3/20	290.500			
21	291.500			
22	300.500			
23	304.000			
24	204.500			
3/27	301.250			
28	305.250		2973.000	297.30
29	297.750	+7.750	2980.750	298.08
30	300.250	+8.750	2989.500	298.95
4/3	300.500	+6.500	2996.000	299.60
4	299.750	+9.250	3005.250	300.53
5	302.250	+10.750	3016.000	301.60

[*] Difference (plus or minus) between latest close and the tenth close, counting back.

[†] Sum of 10 latest closes.

[‡] The 10-day-total column divided by 10. These figures in sequence make up the moving average.

any change in trend. New trends will be acted on earlier and do not need much time to establish themselves. The trader pays for this sensitivity because the shorter the moving average's length, the greater the number of trades that will be made. This means greater commissions and a larger number of whipsaw losses. A longer period of time used to calculate the moving average will reduce the number of trades and the number of whipsaw losses but will signal new trends much later—often so late that the trend will be closer to completion than initiation.

2. The kind and amount of penetration required. In an effort to reduce false signals, many technicians demand more than just a simple penetration of the moving average; for instance,

FIGURE 6–5

Soybeans, weekly chart, with moving averages.

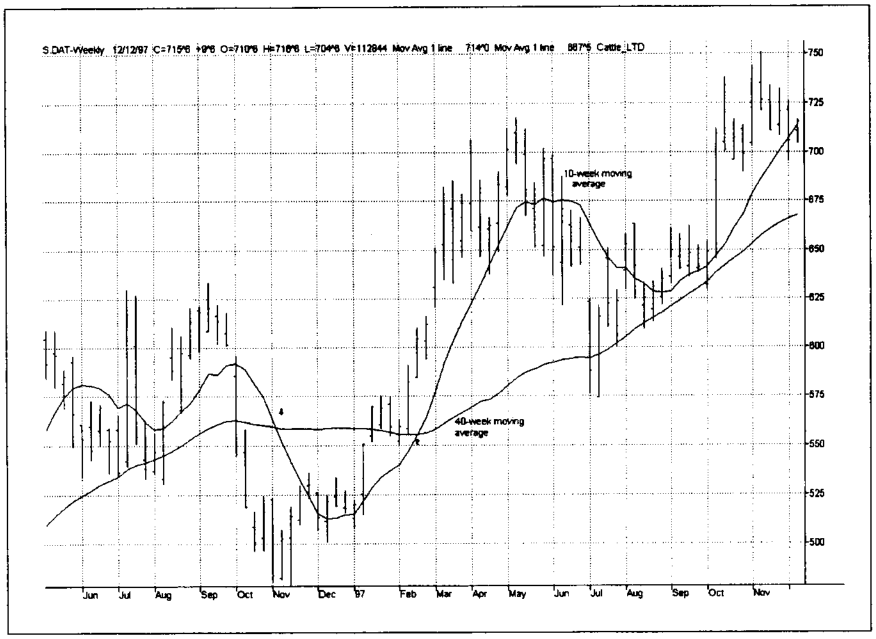

Chart created using Tradestation 4.0 by Omega Research, Inc.

requiring that the price in Figure 6-5 penetrate the moving average by 5 cents as a prerequisite for acting on any signal would eliminate several whipsaws. Other technicians try to eliminate “meaningless penetrations” by requiring “a material length of time” to elapse before a “signal” is followed. Still others try to measure the angle of penetration and require that the angle be “significantly great” before a trade is made.

These strategies, however, are subject to the same limitations described above. Too small an amount of penetration, however measured, does little to reduce whipsaws. Too large a penetration eliminates trades that would have yielded adequate profits and reduces the profits on those which are accepted. Although considerable effort over many years has been expended in attempts to establish the sizes of successful filters, nothing printed to date appears to help traders attempting to make sufficient profits after execution costs to justify their risks.

Striking the Balance—Advantages and Disadvantages of Using Trend-Following Methods

The Advantages

(*a*) A trend-following technique is, by definition, objective. All the elements must be clearly defined before it can be put into practice. This means that traders can, if they have the facilities, determine how well any technique has worked in the past and define its important characteristics. Any number of variations can be back-checked in an attempt to optimize results. (*b*) Any trend-following method provides traders with a sizable part of their operating plans, with all the attendant benefits in terms of results and peace of mind. Because their action points are so clearly defined, the traders are not so likely to be beset by uncertainties. (*c*) Trend followers believe, along with many famous traders, that "the big swing makes the big money." By employing any trend-following method it is impossible for a big move to occur without their participating in it.

The Disadvantages

(*a*) Traders who use trend-following methods begin with at least two counts against them. First, whipsaws are inevitable and frequent. Second, all signals acted upon are late by definition. To compensate for both of these liabilities, the trader must realize frequent enough or large enough profits on the successful signals. (*b*) A future moving within a trading range will provide the trend follower with seemingly endless losses until a major trend is initiated. Large numbers of long positions will be taken on strength near the top of the range and short positions on weakness near the bottom. In that even cursory observation indicates that most markets fluctuate in trading ranges most of the time, it seems clear that trend followers will probably suffer losses on most of their trades. "Rules" developed in some markets will not work in others or even in the same markets during other periods. Attempts may be made to adapt the rules to volatility, but predicting volatility is no easier than any other kind of market prediction.

CHARACTER-OF-MARKET ANALYSIS

The trader using character-of-market methods operates on premises completely different from those of the chartist or trend follower, both of whom have constructed a number of techniques based on the interpretation of price action. Those technicians who employ a character-of-market approach believe that a deceptive veneer has been painted over the true picture of supply and demand.

The character-of-market analyst seeks statistical measurements of supply and demand that are independent of price or at least uses price information much more subtly than the chartist or trend follower. The important question asked by those traders who use this approach to technical analysis is, "What is the *quality* of a given move in price?" The trader then tries to commit his or her capital in line with price movements of good quality and to avoid, or even take an opposite position to, movements of poor quality.

As noted before, the technician has only three series of trading data to work with: price, volume, and open interest. Nevertheless, so many combinations and permutations of these data have been employed in character-of-market methods that it is possible here to touch only on the most illustrative and basic.

Oscillators

In a broad sense all time series oscillate. Trends, seasonals, and cycles can all be regarded as oscillating time series. Like so many other definitions in the area of technical analysis, the definition of "oscillator" is different for different people. As used here, the term "oscillator" refers to a family of technical indicators based on measurement of price changes rather than price levels.

The use of any oscillator rests on one or both of these contentions:

1. A price rise or price decline can become overextended if it gathers too much velocity. If the price of any future enjoys an unusual gain that is compacted into a short time span, the presumption is that buying is temporarily exhausted and part or all of the gain will be retraced. Such a market is said to be "overbought." The opposite kind of price action would lead to an "oversold" market. By constructing an oscillator the technician seeks to monitor excessive rates of price change that could lead to exhaustion and subsequent price reversals.
2. A price trend can simply peter out as it steadily loses momentum. In this case a price trend continues but generates less and less energy until it dies. A top is signaled when, for instance, the price continues to make new highs for the move but the oscillator moves from large positive numbers to small positive numbers. The reverse is true for a bottom. Used in this way, an oscillator is a tool for measuring the exhaustion of a price trend.

One of the most popular of these indicators is the stochastic oscillator, which was developed by George Lane. The stochastic emphasizes the closing price relative to the high and low for the period. One stochastic value is called the %*K* and is calculated as follows:

$$\%K = \frac{C_i - L_n}{H_n - L_n}$$

where C_i = closing price in current time period
L_n = lowest low during the n time periods
H_n = Highest high during the n time periods
i = specific time period
n = number of periods

The %*D* value is simply the moving average of the %*K* value. Stochastics can be varied to give faster or slower signals just like a moving average.[11] Values below 30 percent suggest the market is oversold, whereas values over 70 percent imply that the market is overbought and ripe for a correction. Many types of rules can be developed to trade with stochastics. For example, one rule is to sell when the fast (%*K*) crossed the slow (%*D*) and both are pointing down but above the 70 percent level. A buy signal would be generated when the fast crosses the slow, and both point up but are below the 30 percent level.[12] Figure 6-6 shows the oscillator applied to a price chart of soybeans. Readers will note that false signals are most likely when the market is in a sustained trend, but seems to work well in range-bound markets.

Striking the Balance—Advantages and Disadvantages of Using the Oscillator

The Advantages

(*a*) Overbought or oversold signals generated from oscillators will usually work well in trading markets, which occur more frequently than trending markets. If there is no dominant trend, points of upside and downside exhaustion can, in theory at least, be identified with a fair degree of accuracy. (*b*) Signals of an overbought or oversold market can act as a valuable check on a trader's emotions. No matter how bullish a situation may appear,

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[11] Robert Rotella, *The Elements of Successful Trading* (New York: New York Institute of Finance, 1992), p. 219.

[12] Ibid., p. 221.

FIGURE 6-6

Weekly soybeans with moving averages and stochastics.

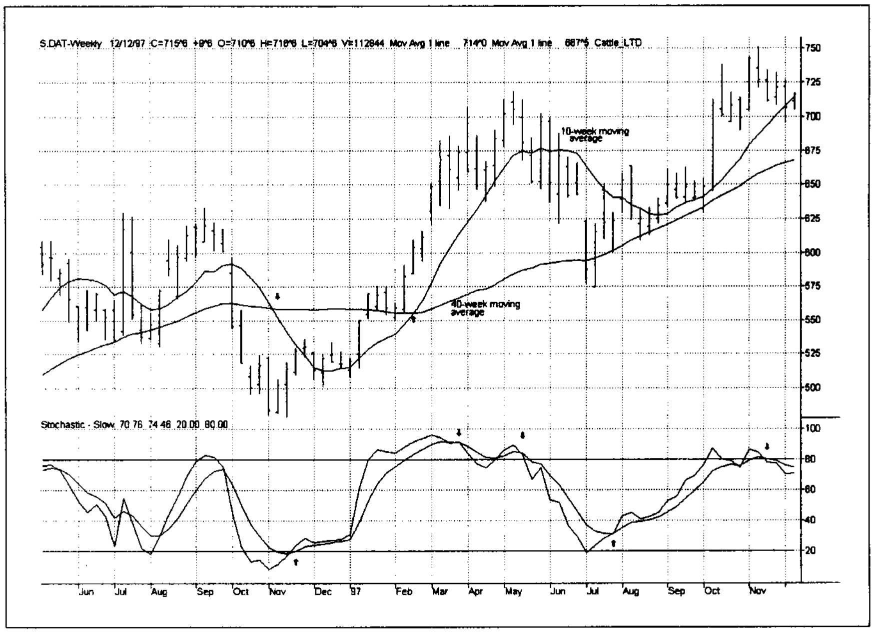

Chart created using Tradestation 4.0 by Omega Research, Inc.

a high positive reading on the oscillator at the same time could be a sobering influence. The reverse is also true. (*c*) History is replete with examples of price trends that peaked or troughed, whereas accompanying rate-of-change oscillators showed a clear loss of momentum well in advance.

The Disadvantages

(*a*) Acting on overbought or oversold oscillator signals will lead to financial disaster in any market with a dominant price trend. During a powerful bull or bear swing an oscillator will repeatedly move into "overextended" territory and will often stay there for a long time. This danger cannot be avoided because a trader who could consistently anticipate dominant price trends in advance would not be using an oscillator as a trading device. (*b*) Zones that represent overbought or oversold markets must be decided on the basis of history. If the future being followed suddenly becomes either more or less volatile, whether still in a trading range or not, previously determined zones will be worthless. All futures do change their volatility over time. (*c*) Loss of momentum before key tops and bottoms are reached is well documented, but this phenomenon is much easier to see in retrospect. In practice, declining momentum will indicate a pause in the price trend or a reversal, and there is no way to tell which. Using this technique, analysts can often explain past price action, but they cannot easily predict future price changes.

Traditional Volume and Open-Interest Methods

"Volume" refers simply to the aggregate number of contracts or bushels of futures traded in a given period; it is a measure of the combined futures market supply and demand for that period. "Open interest" is the total purchase or sale commitments outstanding. At any time, the purchase commitments or number of contracts "long" is equal to the sale commitments or number of contracts "short." The different types of trades and their effects on the open interest are listed below. "Old" buyers are those who have outstanding long positions, whereas "old" sellers have outstanding short positions in the market. "New" buyers or sellers are those who are just entering the market to take a long or short position.

Transaction	Effect on Open Interest
Purchases by old sellers from old buyers	Reduced
Purchases by old sellers from new sellers	Unchanged
Purchases by new buyers from old buyers	Unchanged
Purchases by new buyers from new sellers	Increased
Sales by old buyers to new buyers	Unchanged
Sales by old buyers to old sellers	Reduced
Sales by new sellers to old sellers	Unchanged
Sales by new sellers to new buyers	Increased

The open interest increases only when new purchases are offset by new sales. Decreases in open interest occur only when previous purchases are sold and are offset by the buying in of previously sold contracts. Since it is the effect on open interest that is reported and not the type of transaction, the technician interested in this aspect of market behavior must infer the latter from the former.

Volume and open-interest data are reported daily in newspapers and by wire services. They are also printed and distributed at different intervals by the CFTC and by various advisory services. Most technicians use the totals for both the volume and open interest of a given future rather than the figures for individual contract months.

Significant changes in volume and open interest may last for a few days or for extended periods. Changes must be related to their respective seasonal patterns before a meaningful analysis may be undertaken. The seasonal changes are usually more substantial and more significant for open interest than for volume. Those who fail to consider seasonal influences are in danger of making serious misinterpretations of apparent large increases or decreases of the raw data.

Because there is no measurable seasonal pattern for volume, technicians generally compare it with that of the immediate past. For example, if the total platinum volume has hovered around 500 contracts a day and suddenly increases over a period of a few days to 750 contracts a day, a significant change in market psychology may be occurring according to those who believe that volume is significant.

General rules have been formulated to indicate how significant net changes in open-interest and volume figures may be analyzed in conjunction with price analysis.

The tendencies for volume alone may be summarized as follows:

1. When a major price advance is under way, volume tends to increase on rallies and to decrease on reactions.
2. Conversely, during a major price decline, volume tends to increase on down moves and decrease on rallies.
3. Volume expands sharply as bottoms and tops are approached.

Open interest, when compared with price action, tends to act in the following ways:

1. If prices advance and open interest advances more sharply than a seasonal analysis would suggest, aggressive new buying would seem to have taken place.
2. If prices advance and seasonally adjusted open interest declines, the advance has been fueled by short covering and might be regarded as technically weak.
3. If prices decline and aggressive new selling is taking place, the market may be considered to be technically weak.
4. If prices decline and open interest decreases beyond seasonal expectations, the decline has been fed by discouraged longs who

have liquidated their unprofitable positions, leaving the market relatively strong technically.

A perhaps oversimplified form of some of the relations among volume, open interest, and price is sometimes given as follows:

If prices are up and (a) volume and open interest are up—the market is strong;
(b) volume and open interest are down—the market is weak.
If prices are down and (a) volume and open interest are up—the market is weak;
(b) volume and open interest are down—the market is strong.

Figure 6-7 shows a price history of soybeans with volume information shown at the bottom of the chart.

FIGURE 6-7

Weekly soybeans with moving averages, stochastics, and volume.

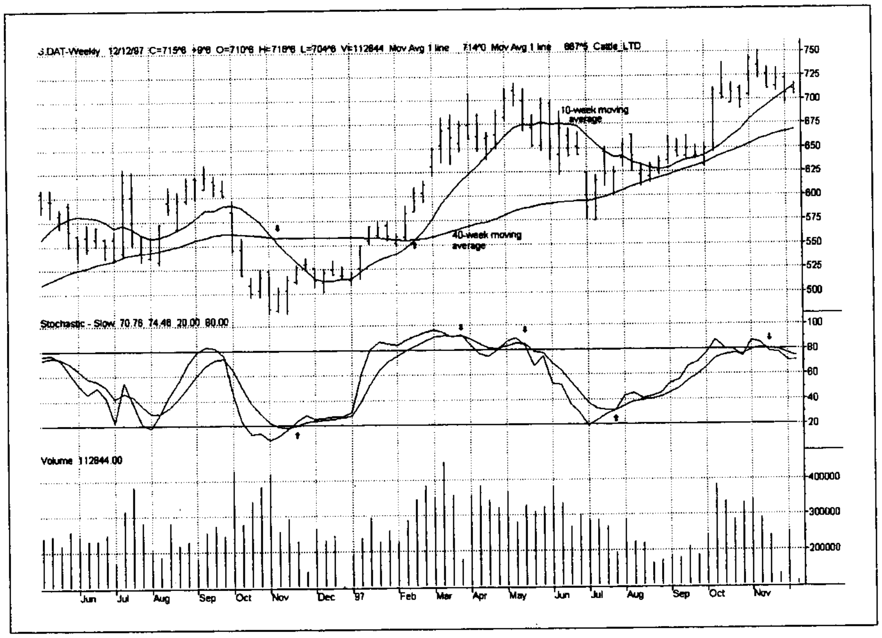

Chart created using Tradestation 4.0 by Omega Research, Inc.

Striking the Balance—Advantages and Disadvantages of Using Traditional Volume and Open-Interest Methods

The Advantages

(*a*) The basic principles of interpreting volume and open interest appear quite logical. It seems reasonable that the expansion and contraction of volume and open interest compared with price action should yield worthwhile clues to the balance of supply and demand in the market. (*b*) The trader following volume and open-interest principles uses a three-dimensional model rather than one of single dimension found in other technical approaches. There are many other ways in which price action can be viewed, and many more shadings can be used to describe bullish or bearish behavior. (*c*) If the forecasting ability of volume and open interest is denied, there is still a significant amount of information to be obtained by simply monitoring such data. The trader knows which contracts are most active, the size of the market in which he or she is dealing, and any important properties of trading activity.

The Disadvantages

(*a*) This type of analysis is replete with a number of ill-defined terms: "low volume," "increase in open interest," "decline of greater than seasonal expectation," and several others. To make use of this approach, technicians must quantify their terms to avoid meaningless generalities. (*b*) General rules for volume and open-interest interpretation are well publicized. Application of these classical principles leads to the problem of the "self-fulfilling prophecy" discussed among the disadvantages of using price patterns. Volume and open-interest behavior which is clearly bullish or bearish can be discounted in the present price level as easily as other more familiar supply-demand factors. (*c*) The validity of these standard principles rests on unproved assertion. No publicly available studies that use volume and open-interest decision rules confirm their value in actual trading.

Analysis of Open Interest to Determine Activities of Large and Small Traders

Another way to measure accumulation and distribution is the proposal made by many technical analysts to differentiate between "smart money" and "stupid money." Those making this differentiation believe that there are, essentially, two categories of traders: winners and losers. For example, in the stock market, exchange specialists have often been identified as a winning group and odd-lotters as a losing group. Techniques long in use with these and other groupings can be applied to futures as well. An attempt is made to identify the winning group and the losing group and then discover in a timely manner what one or both of these groups are doing. Positions are then initiated either with the winning group or opposed to the losing group when either shows a strong preference for one side of a market.

In the futures game, the best source for this type of information is the CFTC Commitment of Traders (COT) Report. The report distinguishes among large speculators (those that trade at or near CFTC-regulated position limits), small speculators (individual traders), and hedgers (companies who use the futures markets as a way to reduce their exposure) and is released weekly. Most users of this method believe that large speculators as a group tend to make money, small speculators tend to lose, and hedgers over time break even. (Refer to Chapter 2 for more information on the commitment of traders report.)

There has been considerable research into this trading strategy. Hartzmark[13] used statistical techniques to determine if any of the types of traders won or lost consistently. His study had three broad conclusions: First, there are fewer market participants with significantly superior skill than expected if participants trade randomly; second, there are more traders showing no skill than expected if participants trade randomly; and third, forecasting ability is not correlated over time—superior forecasters in the early period are only average forecasters in the later period. Therefore, Hartzmark concluded that luck is the determinant factor in trader performance. His findings were in stark contrast to earlier studies that found that large traders as a group make money and smaller traders consistently lose money.[14]

Striking the Balance—Advantages and Disadvantages of Using Open Interest to Reveal the Activities of Large and Small Traders

The Advantages

(*a*) Similar techniques have been used with some purported success in the stock market for many years. The breakdown of open interest available on futures yields series of data that are analogous to those used in stock market analysis. (*b*) Whether or not traders successfully construct valid tech-

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[13] Michael L. Hartzmak, "Luck versus Forecast Ability: Determinants of Trader Performance in Futures Markets," *Journal of Business* **64,** No. 1, (1991), 49–73.

[14] These studies are examined in detail in Chapter 14.

nical indicators from open-interest breakdown, knowledge of the current interplay among hedgers, large traders, and small traders might be helpful in explaining market action in any future.

The Disadvantages

(*a*) The work that has been done on the behavior of large and small traders argues against the value of open-interest breakdowns. Small traders, rather than acting consistently on the wrong side of the market, are better described as trading haphazardly. Large traders are consistent winners but are short-term-oriented as a group.[15] It might be concluded that there is no available information on "stupid money" and that "smart money" data are available but come too late and too infrequently to have value. (*b*) Open interest is available to the public only with a time lag of days or weeks, thereby making the information virtually useless. (*c*) The fact that there is so little published work in this area may not reflect the failure of futures traders to take advantage of its latent value. It may rather indicate that detailed timely data are unavailable or that traders have tested the approach and found it of no value.

Contrary Opinion

> . . . the supposedly stolid Dutch were overcome by the Tulip Craze, the volatile French had their Mississippi Bubble, while the sturdy English had their South Sea Bubble.
>
> As I read the account of these madnesses, I was tempted to shout, "This cannot have happened." Yet within my own lifetime I have seen similar deliriums in the Florida land boom of the 1920's and the stock market speculation that led to the 1929 crash. Something of the same crowd madness may have been at least partially responsible for Hitler's rise to power in Germany.
>
> These crowd madnesses recur so frequently in human history that they must reflect some deeply rooted trait of human nature . . . if his book showed how baseless are man's moods of wild hope, it also showed that man's moods of black despair are equally unfounded. Always in the past, no matter how black the outlook, things got better. . . . Whatever men attempt, they seem driven to try to overdo.[16]

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[15] C. S. Rockwell, "Normal Backwardation, Forecasting, and the Returns to Speculators," *Food Research Institute Studies,* Supplement 7 (1967), 107–130.

[16] Bernard Baruch, *Baruch: My Own Story* (New York: Henry Holt & Co., 1957), p. 219.

With these words, Bernard Baruch explained how he related an account of the "madness of crowds"[17] written in 1841 to the extremes of psychology that he had observed in his own experience. His astute decision to sell his holdings in 1929 had been credited to his reading this book at an opportune time. Baruch apparently never attempted to utilize the lessons of history contained in Mackay's book in any systematic way, but a stock market analyst named Humphrey Neill did ponder on the implications of swings in mass psychology. The result was a new way of thinking called "contrary opinion."[18]

Neill's contention was that crowd madness did not have to go to the point of making history before it could be detected and used to advantage. His belief was that any crowd, such as stock or futures traders, could frequently be carried to extremes of action and opinion. Astute observers could recognize these extremes and act opposite to the prevailing psychology to their own advantage. In other words, they would adopt a "contrary opinion." Neill attempted in his book to demonstrate that this phenomenon extends beyond trading stocks or futures. He noted that popular expectations before many major world events were directly opposite to what actually happened. Only its use in futures trading, however, is considered here.

In market letters and boardroom talk the term "contrary opinion" appears frequently. Apparently most traders have come to believe that the contrarian takes positions opposite the prevailing opinion almost as a reflex action. This popular notion is far too simple; the true contrarian does more than merely lean against the current state of thinking.[19]

Before money is committed to a trade, the contrarian insists that certain basic elements be present. First there must be a strong consensus about the future price or behavior of a future. This opinion must be almost unanimous—virtually taken for granted—before there is any chance that mass psychology has been carried to extremes. Examples of widely held

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[17] Charles Mackay, *Extraordinary Popular Delusions and the Madness of Crowds* (London: L. C. Page & Co., 1932), reprinted from the 1841 edition. Several reprints of this book have since been published; it documents scores of historical occurrences in which people lost all semblance of reason and were dominated by mass psychology.

[18] Humphrey Neill, *The Art of Contrary Thinking* (Caldwell, Ohio: The Caxton Printers, 1960), is the definitive source of information on contrary opinion.

[19] R. Earl Hadady has acquired a wide reputation in the area of contrary opinion. In addition to several periodicals, including *The Professional Chart Service, The Commodity Spread Trader,* and *Market Vane,* Mr. Hadady has published a book, *Contrary Opinion; How to Use It for Profit in Trading Commodity Futures* (Pasadena, Calif.: Hadady Publications, Inc., 1983).

opinions that would interest a contrarian would be "Beans are going much higher," "September bonds will go off the board weak," "February bellies will gain on the May," and "Cocoa will take its lead from next month's purchase figures and not do much until then." Any of these opinions unfulfilled could represent a trading opportunity. Note that the opinion need not be only one of price direction. A normally popular future that has been unusually neglected is one example of a consensus that could provide a contrarian with much food for thought.

A second and equally important prerequisite is that the strong bias of opinion be supported by "weak" reasons. In determining how strong or weak these supporting reasons are, the contrarian differs sharply from the fundamentalist. The trader using contrary opinion is not interested in how important the facts are or even whether they are true. The reasons behind an opinion are judged strong or weak only according to the manner in which they have been disseminated and the reaction they have produced.

To the contrarian, supporting reasons are weak if they have one or both of these characteristics:

1. The facts have been widely publicized and well known for some time.

The presumption here is that any such facts are already discounted in the current price. For example, suppose that the great majority of traders are bearish on wheat. If such a position is popular because a coming bumper crop has been apparent for several weeks and prices have already dropped substantially, the question of how much risk remains on the downside may well be raised. If news of the impending record crop has generated most of the selling it warrants, any favorable developments will be a surprise to most traders.

This kind of well-publicized fact is especially weak if its realization is far in the future. If, for example, the expected bumper crop is many months away from being harvested, a great many things could happen in the meantime (including the discovery that the crop is not nearly so large as the earlier estimates) to change the present bearish psychology sharply.

2. The facts of the situation are not known but only supposed.

This sort of situation can occur anywhere, but is more common in international commodities, such as sugar, cocoa, copper, silver, coffee, and currencies. Opinion is formed on the basis of preliminary indications that have all been in agreement but for which no hard evidence is yet available.

Cocoa may be regarded as an exceptionally bullish situation on the basis of preliminary crop estimates long before any solid facts are in on the crop size. Even if the crop is small, such expectations may already have been discounted in the current price. Other than extravagantly bullish news could find the market vulnerable to decline following the first factual reports.

If the trader who uses contrary opinion can find a situation in which there is a near-unanimous opinion supported by weak reasons, he or she has, at least in theory, found a trade with high potential and low risk. The low risk comes from the probability that the factors that caused the consensus have been discounted. The high potential comes from the element of surprise that can be a dominating influence when mass psychology carries to extremes and only one-sided news is expected. If the reason behind the crowd's opinion turns out to be entirely invalid, which has happened frequently in the past, the contrarian gains a bonus.

Striking the Balance—Advantages and Disadvantages of Using Contrary Opinion

The Advantages

(*a*) More than the premises of almost any other technical approach, the premises behind contrary opinion are solidly logical. When strong feelings prevail toward a particular future, it is indisputable that conditions in that market are abnormal. Most known facts are likely to have been discounted completely or partly, offering little potential to the trader who is following the lead of the majority. Of equal importance, such a market is extremely vulnerable to unexpected developments not in line with current thinking. (*b*) Even if a contrary opinion approach is not used to signal trades, it can be valuable to the trader who wants to keep emotions in check. Watching for weak reasons behind strongly held opinions will keep the trader from being carried away by the arguments of the moment and losing perspective. (*c*) A contrary approach can often turn up important facts for both the technician and the fundamentalist. Contrary opinion is more than a means of generating signals. It is a way of thinking that can be conceptually and practically useful. In the final analysis the success of contrary opinion depends completely on neglected facts coming to the fore. By directing attention away from popular thought patterns contrary opinion is one method whose primary purpose is to enable traders to think for themselves and possibly to unearth key factors on which trades may be based.

The Disadvantages

(*a*) Collecting an accurate sample of opinions can be most difficult. Myriad sources must be consulted to determine whether there is a strong consensus toward any future. Newspapers, brokerage house letters, private advisory letters, brokers themselves, their clients, and the "signals" currently being given by popular trading methods are only a few of the inputs needed to monitor a consensus situation that may be shaping up. It can be an arduous—sometimes almost impossible—task to uncover the prevailing psychology, even given a strong consensus. (*b*) Even if the state of prevailing opinion is known, the depth of that opinion may be hard to evaluate. One group of traders expecting lumber to "consolidate and retrace recent large gains during the next few weeks" is certainly not so bearish as others who expect a major collapse. Weighting these and other shades of opinion can be a perplexing problem. (*c*) Although contrary opinion can provide the trader with numerous psychological advantages, it can spawn at least one large psychological disadvantage. Used heavily, it can breed arrogance. (*d*) Points of extreme mass psychology in any future are quite infrequent. Even the most adept contrarian may have to wait a long time between trades. (*e*) The approach is not as precisely quantitative as is generally believed. Because of this, contrary opinion has not yet been put to an objective historical test to determine its validity and characteristics, as some other technical methods have. (*f*) It is much easier to initiate trades by following a contrary opinion method than to know when or where to close them. In closing a trade, the contrarian must rely heavily on other methods or personal judgment.

STRUCTURAL THEORIES

The final quadrant of technical analysis is as controversial as it is varied. Structural theories include the seasonal approach, which is widely respected and used among technicians. It is similar to the cyclical approach, although the latter reflects longer time cycles and different inputs. Some who utilize structural theories base their decisions upon inputs which many would consider bizarre. Such exotic theories are not discussed here, but if a trader is able to make money in the markets consistently by analyzing comic strips or following voices heard in the night, that person would be wise to do so.

Technicians who use structural theories do not construct indices for predictive purposes as is the case in character-of-market analysis, nor do they rely on trend following as an aid in making decisions. Structural theorists believe, rather, that an intensive study of historical performance will reveal understandable and repeating price patterns in the market itself.

This approach is quite different from that discussed earlier of looking for nonrandom price patterns on charts. Such price patterns as are deemed to be predictable are expected to occur at irregular intervals, consume a relatively brief period, and predict prices only for brief periods. Their form is quite general and may assume many variations. Those who use seasonals, along with those who use such other components of time series as trends or cycles, consider them to be far more comprehensively based. Prices are seen as "following a blueprint" that can provide valuable guidance at all times. The trader who understands this blueprint will know where prices stand within the structure and can determine where they are going next.

Seasonal Price Movements

The most respected structural blueprint attempts to define times of the year when futures prices have a high probability of moving in one direction or the other. These seasonal price trends are usually due to the particular way a future is produced and/or distributed. In grains, for instance, the sudden increase in supply at harvest time should lead to lower prices. Later in the season, as supplies are used, prices could be expected to rise. Indeed, the desire to stabilize seasonal price fluctuations was one of the most important reasons leading to the birth of the Chicago Board of Trade.[20] It was believed, and subsequently confirmed, that a futures market could at least moderate the violent seasonal price tendencies in grains.[21]

Traders using seasonals believe that although futures trading has moderated formerly more marked price tendencies, these price tendencies have not been eliminated. They contend that there are specific times in some futures markets that remain significant each year. Some of these traders believe that the seasonals provide profitable trading opportunities. Others believe that, as a minimum, seasonals influence prices enough to be considered as an element in broader trade selection methods.

Because, ultimately, any seasonal price pattern is produced by an interplay of production and consumption factors, some would consider such patterns to belong in a fundamental rather than a technical approach to trading. Others might argue that seasonals are repeating patterns of price action that can be discovered and measured from observations alone without regard to factors underlying production and consumption. There

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[20] See Chapters 1 and 2.

[21] See Chapter 4.

is, of course, considerable overlap in these "two types" of seasonals. This is not unusual in discussions of fundamental and technical analysis, which often blend together rather than remain distinctly separate.

Traders who believe in using seasonals almost exclusively for trade selection go so far as to develop a "calendar portfolio" of seasonals which purports to indicate action to be taken in various futures at specific periods. Sometimes these seasonal "blueprints" suggest particular periods during the year during which rising or falling prices are likely. Others attempt to indicate particular months during which the high or low for the entire year is most likely to occur.

Another form of seasonal analysis particularly favored by some full-service brokerage houses that specialize in futures is called a "conditioned seasonal." This is a concept which maintains that a price move will follow the occurrence of some specific precondition. Examples of such allegations are "Potatoes will advance into January if they make a new high in November" and "January soybeans will gain on deferreds if Chicago stocks are low in November."

Striking the Balance—Advantages and Disadvantages of Using Seasonals

The Advantages

(*a*) If any clear, repeating seasonal tendency has been isolated, the trader can usually then determine the dominant reason for its existence. As long as that reason exists in succeeding years, the presumption is that prices will probably repeat their performance. (*b*) Seasonal information can be used to argue for or against trades accepted in any other form of analysis. The trader who wishes, for example, to short orange juice during the last half of October is made aware of a strong tendency for prices to rise at that time of year. When any commitment is made, seasonal information may help in appraising the risks. (*c*) If nothing else, careful analysis of seasonals can help the trader to achieve a better understanding of the basic forces affecting the balance of supply and demand in any single future.

The Disadvantages

(*a*) The means by which futures are produced and consumed are always in a state of flux. For this reason the life span of the best validated seasonal tendency can prove to be quite limited. (*b*) Any seasonal tendency that becomes well known is almost certain to be totally smoothed out as more and more traders act on it. Seasonal forces can be discounted in the price like any other fundamental or technical inputs. (*c*) Although seasonal trading is almost unique in its ability to indicate entrance and exit dates to positions in advance, little is said about interim risk. In holding positions for long periods, traders are subject to the chance of considerable risk while waiting for the presumed gain. Such traders might be forced out of positions by variation margin calls before they realize their ultimate profits. Even those who could afford to hold their positions would have to consider the possibility that the losses might continue to grow because the seasonal is overwhelmed by other factors. How is the trader to control losses in seasonal trades? The answer is not clear. Those who choose to utilize the seasonal approach to decision making must realize that seasonal analysis usually provides little information on interim risk. Judgment must be utilized to determine if a seasonal trade is on course, and the trading plan must be broad enough to deal with interim adversity.

Time Cycles

Seasonals, no matter how derived, deal with repeating annual phenomena. For at least the last century, however, a great many investigators have concluded that there is a longer-term structure in futures prices.[22] Even longer-term cycles have been isolated and documented. In 1875 Samuel Benner wrote a short book wherein, among other things, the prices of pig iron and corn were predicted for the next several decades. Had a hypothetical trader, with the required money, warehouses, and other resources, bought and sold pig iron during the years indicated, dollar gains would have exceeded losses by a ratio of 31 to 1.[23] Benner's predictions on corn were less spectacular, but gains still shaded losses by a margin of 3¼ to 1, and the average annual gain from trading in cash corn would have exceeded 7 percent compounded. Results like these, achieved over a span of more than

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[22] Perhaps the first person to investigate time cycles in a scholarly way was Hyde Clark, who alleged an 11-year cycle in speculation and famine in 1838. Influenced by Clark, William Stanley Jevons published *The Periodicity of Commercial Crises and Its Physical Explanation* and *The Solar Period and the Price of Corn* at the University of Manchester in 1875. Jevons's thesis was that repetitive cycles in sunspots affected crop yields, and therefore prices, on a predictable basis.

[23] Samuel Benner, *Benner's Prophecies of Ups and Downs in Prices,* privately printed, Cincinnati, Ohio, 1875 (reprinted by The Foundation for the Study of Cycles, 124 South Highland Avenue, Pittsburgh, Pa. 15206).

80 years, strongly suggest that Benner's success might have been correlated with underlying cyclical phenomena.

Technicians who use time cycles to forecast prices employ a unique modus operandi. They believe that back records of prices contain evidence within themselves of at least one and usually several time cycles during which prices are carried up or down. Whether a computer or paper and pencil is used, the trader attempts to isolate and quantify the important cycles in any future. These cycles are then combined to yield a prediction of the dates of future high and low prices. The trader then takes action accordingly.

Most of those who use time cycles simply maintain that important price highs and lows are spaced by distinct repeating intervals over periods typically ranging from 2 to 6 years. Among the oldest such cycles observed is the 67⅓-month cycle, which some believe is followed by the corn market.

Others use complex and sometimes highly sophisticated mathematical models designed to define precisely the timing, shape, amplitude, and other characteristics of the time cycles being investigated.

Although any trader can use a record of futures prices to discover price cycles after the fact, this approach has never been overly popular. The literature on the subject is sparse, and only a few services emphasize this approach. Traders must decide for themselves whether the relative lack of interest in the method presents an opportunity or whether it means that traders lack the patience to trade with cycles or have concluded that the method is of no value.

Striking the Balance—Advantages and Disadvantages of Using Time Cycles

The Advantages

(*a*) Some evidence may indicate that time cycles are real phenomena and not statistical fantasies. Sophisticated mathematical tests can indicate the probabilities that observed cycles are due to chance. Trading futures on the basis of time cycles is at least theoretically possible. (*b*) Even if time cycles are not used to signal commitments, such research might at least be helpful in appraising the risk underlying trades.

The Disadvantages

(*a*) Not all the evidence indicates that cycles are real phenomena. Mathematical techniques to date have not supported the contention that repeating time cycles of any length are present in futures prices. (*b*) Even if cycles are accepted as real phenomena, there is still much about them that is not known. It is impossible to know for any particular future what causes observed cycles, how many cycles are currently influencing prices significantly, or even the curvatures of the cycles. That there is nothing approaching a complete cycle model is a major obstacle to the technician attempting to use cyclical data. Any time cycle isolated by a trader might prove to be useless as hidden properties of the cycle become apparent, other undetected cycles nullify or override it, or all cycles are overwhelmed by powerful shorter-term influences. (*c*) Most of the published research in commodity price cycles has been conducted with cash rather than with futures prices. Cash and futures markets often do not move in tandem. Futures have a limited life, and some represent different crops, which makes it difficult to analyze prices in a meaningful way. (*d*) Even with complete and accurate knowledge of a cycle, the trader can never have a complete picture. Important current developments can ruin the clearest cyclical indications, with prices getting back "on track" too late to help the trader or, perhaps, not getting back at all.

The Elliott Wave Theory

> As must be common to all who publish investment services, I received frequent letters from individuals who had developed "infallible" methods or systems for forecasting the stock market. My usual reply was that the individual go on record with me over a market cycle after which I would determine whether I cared to investigate the matter in detail. In most instances, at some point in the cycle the system went haywire and correspondence died on the vine.
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> Elliott was one of three notable exceptions. He wrote me from California in late 1934 that a bull market had begun and would carry for some distance. . . . In March 1935 the Dow Rail average crashed under its 1934 low, accompanied by an eleven percent break in the industrial average. Having recent memories of 1929–32, this development scared the lights out of the investing public. On the bottom day for the industrial average, the Rails having leveled off four days previously, I received a late evening telegram from Elliott in which, as was always his way, he *dogmatically* affirmed that the break was over and that another leg of the bull market was beginning. This break, looking back, was Primary Wave No. 2 of the Cycle movement then under way under Elliott's Wave Principle although, at the time, I had no idea as to his method.[24]

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[24] Hamilton Bolton and Charles Collins, "The Elliott Wave Principle—1966 Supplement," *The Bank Credit Analyst,* 1245 Sherbrooke Street West, Montreal 109, Quebec, Canada.

It was in this way that the Elliott wave theory first became known to Charles Collins and then to an ever-wider audience. The theory was discussed by R. N. Elliott in various articles published between 1938 and 1946 and by others in various publications since that time.[25] Elliott himself died in 1947, at which time many of his papers disappeared.

Elliott's basic precept involved a modified cyclical approach to forecasting based upon counting charted waves of advances and declines in stock prices. These waves, Elliott believed, fell into patterns so complete and so comprehensive that one could know at any time where prices stood in their development, how much potential they had on the upside or downside, and roughly how much longer a trend would persist.

Elliott's basic theory was that prices move in a five-wave sequence in line with the direction of the main trend and in a three-wave sequence during "corrective" movements against the main trend. Each wave is broken up into subwaves of its own (either three or five waves), and these waves, in turn, break down into smaller subwaves, and so on. In principle, Elliott waves can be carried down to the level of each individual trade. The theory can also be extended to a larger scale, in which each wave is seen as a subwave of a larger wave, which in turn is part of a still larger wave. In this case, according to Elliott, the result might be waves in prices centuries long. Given this all-inclusive system of categorization, it is theoretically possible for the trader to know where prices stand at all times.

Elliott's wave counts are based on the Fibonacci Summation Series. This series, starting with 1,2,3,5,8,13,21,34,55,89, was developed about 700 years ago by one Filius Fibonacci, an Italian mathematician. Each of

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[25] The most comprehensive single work on the wave principle is Hamilton Bolton, *The Elliott Wave Principle—A Critical Appraisal* (Montreal: Bolton, Tremblay & Co., 1960). Bolton, Tremblay & Co.'s *Bank Credit Analyst* has also published a number of supplements for irregular years, starting with 1961, that seek to update Bolton's original work and provide current interpretations. Cox, loc. cit., is a strong advocate of using Elliott's principles for commodity trading. William O'Connor, *Stocks, Wheat & Pharaohs* (New York: Weiner Books Co., 1961), is an offbeat source of information on Elliott applied to futures prices. The book is out of print but available in many big-city libraries. O'Connor not only uses unique principles of interpretation but is the only source that places great stress on daily charts for identifying Elliott waves in the very short run. Elliott's two monographs are long out of print and almost impossible to obtain, as are past issues of his advisory letters. R. N. Elliott, "The Wave Principle," *Financial World* (1939), reprinted by BCA Distributors, Ltd., Montreal, 1963, consisting of a series of articles that appeared in *Financial World Magazine,* is his only work still readily available. Additional discussions of the theory may be found in *Techniques of Professional Chart Analyst* (New York: Commodity Research Bureau, Inc.) and *Elliott Wave Principles* (New York: Frost and Prechter, 1978).

the numbers in the series equals the sum of the preceding two numbers. Although Fibonacci designed the series primarily for his students, a virtual cult has developed around it. It has been affirmed that both living and inanimate objects obey a number of laws that revolve around the mathematical properties of this series. Some believe that the series enables scientists to predict how populations of animals will multiply, how plants will grow, and how crystalline structures will form naturally.

The ratio of any number in the series to its next highest is 61.82. This ratio is sometimes designated as the "golden mean," and it has found some interesting uses in architecture. Many of the numbers in the series and the mean itself are yielded by various combinations of measurements applied to the great pyramid of Cheops.

Elliott's efforts to adapt his wave theory to prices, the Fibonacci Series, and the golden mean have all been utilized by technicians in attempts to predict prices. There are those who believe this to be one of the most interesting and accurate technical methods extant. Others believe that phenomena which exhibit the proper numerical relationships are held up as proofs of the theory, whereas those which provide the wrong numbers are ignored or conveniently explained away. Such cynics point out that there are enough numbers available in nature and the results of various human endeavors to prove almost anything.

Striking the Balance—Advantages and Disadvantages of Using the Elliott Wave Theory

The Advantages

(*a*) During the time that Elliott was using his method he compiled a spectacular record of forecasting stock prices. Following in his footsteps, both Collins and Bolton continued to make surprisingly accurate predictions of the stock market averages. (*b*) The fact that Elliott's work relies so heavily on the Fibonacci Series carries great weight with those who believe that the series explains much of nature. It has been hypothesized that these relationships are so all-inclusive that they extend into the psychological arena, with price fluctuations of securities and futures reflecting their subtle but all-pervasive influence.

The Disadvantages

(*a*) Elliott never hinted that his "law" might apply to futures prices. His forecasting work centered almost exclusively on the Dow Jones Averages.

Even in individual stocks, research performed indicates that application of Elliott's principle is quite intricate and possible only in selected instances. (*b*) The entire concept of the Elliott wave theory rests on counting "waves." Yet it is impossible to answer objectively the question "What *is* a wave?" Elliott himself gave no answer to this question. This means that the technician is forced to use highly subjective judgment to label a wave on the chart and also to identify the time scale which the wave fits. Waves, sometimes involved in major moves, frequently break up into many more than five subwaves. Either the theory is wrong or some of the waves should not be counted for some unknown reason. This problem occurs quite frequently in Elliott's analyses. (*c*) The theory is so flexible that it is possible to get several radically different wave counts by using the same price data, and leading Elliott interpreters are in almost constant disagreement. A particularly disturbing corollary to all of this is that the more back data the trader has accumulated, the greater the number of possible counts. In most endeavors additional information usually clarifies; with Elliott, additional information can just as easily add to the confusion. (*d*) One flexible aspect of the theory is the fluid concept of "extensions"; for example, a five-wave move can, under Elliott's rules, extend itself without warning into nine waves. These and other features of the theory make it difficult to come to any decisions at any given moment and easy to see the correct count (and decision) after the fact. (*e*) Elliott, beyond question, intended that his wave principle mold current prices into a comprehensive structure that would provide guidance at all times, but virtually any future chart will show long "blank" spots in which it is impossible to get any sort of wave count. Because one of the fundamental tenets of the theory is that *all* waves can be categorized, the existence of these blank spots means either that the premise is invalid or that the count at these times is subtle enough to escape all observers. (*f*) It is not generally realized that Elliott was a mystic who also believed in numerology. In his monograph,[26] published in 1946, he discussed how mathematical relationships in the Great Pyramid of Gizeh not only predicted future world events but tied in with his own wave theory as well! Although the trader should keep an open mind in regard to the claims of technical analysis, a trading method that is in agreement with pyramid numerology should, indeed, be cautiously evaluated.

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[26] R. N. Elliott, *Nature's Law—The Secret of the Universe,* privately published, New York, 1946. Long out of print. The title perhaps indicates Elliott's view of the importance of his methodology.

NOTES FROM A TRADER

Isolating, quantifying, and successfully trading nonrandom elements in futures trading data requires unusual determination and discipline. Technicians must deal with the efficient-market concept and not just ignore it in the hope that it will go away. The probability that the market is strongly or completely efficient is high, although this will probably never be proved or, at least, will never be believed by everyone. If true, the efficient market is a powerful adversary, and in attempting to forecast, technicians must beware of trying to get more out of an experience than the wisdom that is in it lest they become like Mark Twain's cat that "sits down on a hot stove lid. She will never sit down on a hot stove lid again—and that is well; but she will never sit down on a cold one any more."

There seems to be an overwhelming urge among many technicians to develop a simple, totally mechanical system that works with a high degree of accuracy. The professional trader becomes aware that the search for a foolproof trading system in which all observations promptly find their preordained place has the same large challenge and the same small promise as the search for any all-encompassing system in any other discipline, be it medicine, philosophy, or law. The mature trader recognizes that although judgment can be reduced, it can never be eliminated, and many losing trades will mar even the best trading results.

Technical analysis does offer the advantage of smoothing market data and thus makes tracking data somewhat easier. This in turn may help traders exercise sound judgments in making market decisions. Just as fundamental analysis may only explain relationships between supply and demand and not be predictive, technical analysis may serve only to describe what markets have done and not be predictive either. Although neither approach may be predictive, both may provide inputs to help sound judgments to be made if forecasting is possible at all.

Technicians must accept certain facts. Sophisticated mechanical devices may serve only to make markets even more efficient and, hence, forecasting more, not less, difficult. If any faith is to be placed in "trading rules," there is no place for a loose definition of terms. Despite these and other problems there are at least two important lessons to be retrieved from technical analysis. First, almost all methods generate useful *information,* which if used for nothing more than uncovering and organizing facts about market behavior will increase the trader's understanding of the markets. Second, the trader is made painfully aware that technical competence does not ensure competent trading. Speculators who lose money do so not always because of bad analysis but because of the inability to transform their analysis into sound practice. Bridging the vital gap between analysis and action requires overcoming the threat of greed, hope, and fear. It means controlling impatience and the desire to stray away from a sound method to "something new" during times of temporary adversity. It means having the discipline to "believe what you see" and to follow the indications from sound methods, even though they contradict what everyone else is saying or what "seems" to be the correct course of action.

The rewards are great and they are attainable. As one astute observer of the markets remarked,

> . . . commodity price developments are watched by relatively few traders, most of them quite set in their ways; even in the most active futures markets, the volume of serious research by participants seems to be quite small. It is therefore possible that systematic patterns will remain largely unknown for a very long time.[27]

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[27] Hendrick Houthakker, "Systematic and Random Elements in Short Term Price Movements," *American Economic Review,* **51** (1961).

7 CHAPTER

Spreads

"Why worry about realized losses? They are more than overcome by potential profits."

INTRODUCTION

Spreads may be considered by some to represent only a choice in a type of commodity position, but the subject is far broader than that and deserves separate and more elaborate treatment.

Most unsophisticated commodity traders are converted security traders who bring their habits with them. They are much more likely to be long the market than short and know little or nothing about spreads. The professional trader is at least as conversant with the short as with the long side of the market and knows considerably more about spreads.

SPREADS

Spreads may represent a high percentage of the open interest of a commodity, especially among large speculators and commercial traders. They may be entered for either technical or fundamental reasons. The word "spread" has several meanings to commodity traders, but all imply a price difference. Spread in its most general sense applies to the difference between the cash and future prices of the same commodity. In its more restricted senses it may refer to the differences in the prices of various contract months on the same future exchange or the differences in prices between the same or different months in the same or related futures on exchanges located in different cities.

A spread also describes the actual position taken by a trader who is simultaneously long one commodity contract and short another. The trader may hold equal but opposite positions (legs) in two or more different contracts of the same commodity on the same exchange, such as long 10,000 bushels of Chicago March wheat and short 10,000 bushels of Chicago May wheat. This is usually called an "intracommodity" or "interdelivery" spread. An interdelivery spread between, say, May wheat and December wheat would be characterized as an intercrop spread. The trader might also consider an interexchange spread such as long 10,000 bushels of Kansas City wheat and short 10,000 bushels of Chicago wheat in the same or different delivery months. The trader might also establish an intercommodity spread consisting of equal but opposite positions in two different but related commodities on the same or different exchanges; for example, he or she could be long 10,000 bushels of corn and short 10,000 bushels of wheat or long 25,000 bushels of oats and short 25,000 bushels of corn. Opposite positions in unrelated commodities are not considered spreads. A trader may be long copper and short sugar, but these would be considered merely separate positions because there is usually little or no price covariance between copper and sugar.

Historically, the terms "spread" and "straddle" had some shades of difference, but they have since become interchangeable among commodity traders, and in practice the word "spread" is now more commonly used in the futures markets. There was once some tendency for traders to speak of spreads in connection with grain positions and straddles in connection with other commodities, such as cotton. The terms "spread positions" and "hedge" are used interchangeably but incorrectly by some traders. A hedge refers to the concurrent holding of two opposite commodity positions, one in the cash, or spot, market and the other in the futures market. A spread position also refers to two concurrent and opposite positions, but both are in the futures markets. In its more general sense spread describes the price difference between the cash and futures markets in a hedged position. "Arbitrage" is a word related broadly to the others described herein, but it generally suggests two positions entered simultaneously, or virtually so, one long and the other short, "locking in" a price difference so great that a profit is virtually assured. In the commodity markets this condition would exist if the price of a distant contract exceeded the price of a nearby contract by an amount of more than the carrying charge. Another example might be a distorted difference between London and New York or Chicago futures prices caused by changes in transportation costs or currency values. Opportunities may arise from time to time in several futures traded on both foreign and domestic exchanges, but differences in contract sizes might well make taking advantage of such differences difficult. Silver has been one of the more popular vehicles for this kind of trading.

Arbitrages may also be executed in the securities markets by trading the same security on two different markets at different prices or the same security in different forms, such as common stock against convertible bonds, convertible preferred stock, rights, or options. A riskier form of arbitrage might be based upon an assumed merger of two companies whose stock does not adequately reflect the merger. Generally distortions in both securities and futures markets are small and exist only for brief periods, so such opportunities exist primarily for the professionals who have the ready capital to trade on a large scale, good communications, and low execution costs. Individual traders who lack these advantages will rarely if ever discover a realistic arbitrage opportunity and are probably well advised to devote their efforts to achieve profits to some other area.

Significance of Price Differences

Most of the following discussion centers on the taking of a spread position, but it is worth noting how important the spread differences among the prices of various contract months are to the intelligent establishment of a position. Suppose that it is August and that a trader believes that the price of wheat is likely to go up. He decides to establish a position of 10,000 bushels to take advantage of the expected price rise. He is aware that wheat is then trading for delivery in September, December, March, May, and July. How does he decide which to buy?

There are several factors to consider. One is the crop year which he believes presents the greater opportunity. The crop year for wheat begins on July 1. If he wants to take his position in the forthcoming new crop, he has little choice because the only new-crop contract trading in August is the July of the following year. If he believes that the greater opportunity is offered in the current, or old, crop, he must choose among the September, December, March, and May contracts. One factor affecting this decision is the amount of time believed needed for the expected upward price move to develop and when it is expected to begin. If he expects something to happen within a few days because of some near-term development, such as important export business, he could buy any of the old-crop contracts. He would probably lean toward the September delivery because there is less time available for the tightness in wheat to be alleviated, and it would best reflect a tight cash market.

If he expects to retain his position for some months, there is no point in considering September and no great attraction in the December contract. He can gain considerably more time by acquiring the March or May contract, thereby saving the commission that would be incurred if he bought an earlier contract and later "rolled forward" into a later leg.

The choice between the March and May contracts must still be made. Too many traders make this decision with little or no thought at all or, worse, for the wrong reasons. They may choose the March merely because they have been following that contract or buy the May because that happens to be the contract that their salesperson happens to keep on his quote machine or on a quote board in his office. The decision would better be made logically on the current price difference, or spread, between the March and May futures prices.

To clarify this point, assume that the carrying charge on a bushel of wheat is 12 cents a month. That would be the approximate cost of handling, storing, insuring, and financing 1 bushel for 1 month. The cost of carrying a bushel of wheat from the beginning of trading in the March contract to the beginning of trading in the May contract would therefore be 24 cents for the 2-month period. It would be virtually impossible for May wheat to sell for significantly more than 24 cents over the March delivery for long. If it were to do so, it would become profitable for an arbitrager to buy the March and sell the May at the unusually wide price difference. She would be prepared, if necessary, to take delivery of her March wheat on or after March 1, hold her short May position as a hedge, and then deliver her cash wheat against the May contract at her discretion anytime after May 1. More likely, the abnormal spread difference would dissolve quickly, and the arbitrager could simply liquidate both legs of her spread position and realize her profit. In either case, she would be certain of a gain approximating at least the difference between the approximate 24-cent theoretical carrying charge and the wider spread difference at which she had taken her position. Of course, she might gain or lose from a change in the carrying charge while she was holding her position. In addition, her own carrying charge might differ from the theoretical carrying charge.

Because opportunities like this are so obvious to professional traders and profits in the real world are not so easily attained because of market efficiency, the spread difference between March and May would almost certainly stop widening short of the 24-cent full theoretical carrying-charge difference. Yet if the spread difference were perceived as being near the practical limit, it would be of considerable help to a net position trader trying to make an intelligent decision. At near the full carrying charge he would probably place his long position in the March rather than the May contract. The prices of both contracts might rise equally, and he would realize the same gain in either one. Both might lose equally, and he would suffer the same loss in either one. If the spread difference changed, however, it would almost certainly do so either because March went up more than May or down less, and in both cases the trader would find the March contract the better alternative. March could not lose materially on May, and there is no limit to the amount that it could gain on May in a strong market. Not only could it sell for May, but there is no 12-cent barrier to its premium. Because clocks run only one way, nobody has yet found a way to buy the May contract of a commodity, take delivery, and then redeliver it against the previous March contract. When nearby contracts sell for more than distant contracts, the market is described as "inverted." Premiums of nearby contracts over premiums of distant ones can become quite large in strong markets—in some but not all futures markets.

If, with wheat at or near a full carrying charge, the trader believed that wheat was going to go down rather than up and he wanted to go short on either March or May, his decision would be just as obvious. He would certainly go short on the May contract rather than on the March. Here again, the spread difference could change materially only if May lost on March, because March could not lose on May unless carrying charges themselves increased. If the trader's judgment proved wrong and the market turned higher, the probability would be that March would gain on May. This would result in a loss greater than what would have been incurred on May during the same period. With May offering the added attraction of providing two additional months for the trade to work out profitably or for temporary adversity to be overcome, the choice of March would be a poor one indeed.

The traders who must be most alert to price differences if they are to profit from them are the position spreaders.

Spread Positions

Position spreaders are less interested in the direction of price than in the difference between two prices. Instead of deciding that a given contract price is too high or too low, they are interested in taking advantage of price differences that they consider abnormal. The possible positions open to these traders are intracommodity, intercommodity, or intermarket spreads, or a combination of them. The logic of those taking such positions is best made clear by example.

Intracommodity Spreads

Intracommodity spreaders try to take advantage of price differences that they believe are too wide or too narrow in the same market at the same time. They might note that May corn is selling for 18 cents over March and expect a strong market in corn to develop soon. If this should happen, they believe that not only would the general price level of corn go up but the March contract would gain on the May. If they are right, there is no limit to the amount that March could gain because it could not only close the prevailing discount but also sell for more than May by a substantial amount. If they are wrong, there is little to lose because here, again, March cannot sell below the May for long by much more than a reasonably full carrying charge. A spread trader would take advantage of this opportunity by buying the March contract and selling an equal amount of the May against it. This position could be characterized as a "bull spread," and the trader could be said to be "long the spread." The position could be established either by putting on both sides at the same time or by entering one side at a time in order to try to effect a more favorable difference. The latter, called "legging in," takes unusual skill and sometimes results in losing the opportunity observed in the first place.

When the spread has been established, the spreader merely has to wait for March to gain on May as much as she thinks it is going to and then take off (lift) her position. She does this by selling out her March contract and buying in her May. The removal of a spread position is often called "unwinding" or "backspreading." Here, again, she can take off both sides simultaneously by instructing her broker to remove the spread at the current market difference or at a difference of a fixed number of cents. She could also take off (lift) one side (leg) at a time and hope to improve her total profit by doing so. Like entering a spread one side at a time, removing it by lifting one leg at a time is not a good practice. Most trades seem to develop a peculiar knack for taking off the wrong side of their spreads first and then watching a profit achieved over a period of weeks dissolve in a few days or hours.

One of the questions most frequently asked by inexperienced traders is, "Why spread in the first place?" If a trader like the one described above thinks corn is going to go up, why not just buy the March? If the spreader is correct in her analysis, she will make a profit on her March contract, lose on her May, and show a net profit on the difference because the March profit will exceed the May loss. It is obvious that she would have had a greater profit per contract if she had just bought the March. Her action in taking the spread, however, is not quite so foolish as it may appear. By taking the spread position she has reduced her margin requirement. The margin on one contract, 5000 bushels, of March corn long against a short contract of 5000 May might be only $250 for the entire position, compared with a margin of $750 or more required for the March corn alone. If the price of March corn were to rise by 12 cents per bushel and that of May by 4 cents, the return on the margin utilized would be greater on the spreads than it would have been on the net position. The profit on the net March would have been $600 on a $750 margin requirement, or 80 percent. The spread position would provide a profit of $600 on the March and a loss of $200 on the May, but this would represent a net gain of $400, or 160 percent of the $250 margin requirement. If she chooses to be more aggressive, the trader could carry 15,000 bushels in a spread position for the same margin required for a net position of 5000 bushels. This would increase the percentage of net profit on the margin required but, of course, would expand the possible net loss risked as well.

It should be noted that the analysis of the corn situation may have been wrong in the first place and that corn might go down and not up. In that case a net position in March corn could be painful or even ruinous, whereas the spread position could hardly prove too painful because of the limited amount that the March contract could lose on the May. The cost of this "insurance" is not great because the commission on the spread position is only slightly more than the commission on a new position, and the funds needed to margin the position are considerably less. The spread trader may well have increased her potential profit and at the same time reduced investment and not materially increased her relative risk. It is even possible that the spreader could be completely wrong in her analysis and still make money just because she spread. The price of corn could fall drastically, and the price level of May could lose on that of March simply because more net traders choose to sell it or have to sell it because of pressure to liquidate as their margins erode. March, of course, still could not lose too much on the May because of the ever-present watchfulness of the arbitrager. This latter situation merely indicates that not all spreads work and that it is possible to make money for the wrong reason. A cynic might observe that luck beats brains every time.

It should be noted that in the preceding discussion it was assumed that the price of the nearby contract would gain on the price of the more distant contract in a rising market and lose in a falling market. This is true often enough, and so the position is often called a bull spread because it tends to work in rising markets. Careless traders may forget that it is not always true, and, in fact, one who is bullish in some commodities might well choose the opposite positions and be correct most of the time. Bull spreads involving long the nearby position and short the distant typically work best in the case of storable commodities and in the same crop year—for example, long March corn and short May corn or long January pork bellies and short July pork bellies. Storable commodities in which the classic bull spread tends to work include the grains, soybean and soybean products, sugar, orange juice, plywood and lumber, pork bellies, and usually, copper. In the case of some nonstorables, such as cattle, hogs, and Treasury bills, there may be little or no correlation between different commodity delivery months, and spread traders may find themselves simply with two almost unrelated positions, one long and one short. There are even some perverse futures such as potatoes and the precious metals which typically react in a manner opposite that of most storable commodities, and so in bull markets, the nearby contract actually tends to lose ground on the distant. Changes in carrying charges in the case of the previous metals are caused most frequently by changes in financing charges. As the price level rises, therefore, the distant contracts will not only rise along with the nearby but also tend to rise more because financing charges will be incurred on a higher base price. A spreader in these markets is really trading financing costs which will change with price level. Typically, therefore, the silver or gold traders who want to be long for an anticipated long-term rise are foolish to buy the nearby contract. They not only make less money if the market rises, but also may find themselves paying commissions to roll positions forward while obtaining no benefit for the expense incurred.

In this area, as is the case with most rules, one must beware of the exceptions. There is little point in establishing a bear spread by selling the nearby contract short and buying the distant when the nearby is already relatively so low that it cannot lose any more ground. If the nearby contract involves the spot month, its price might be warped by certain technical problems such as delivery points and not reflect its usual reaction to movement in the more distant contracts. Nearby contracts are often expected to reflect strength in the tightness of cash commodities. Some markets, however, respond to other fundamental, technical, or speculative forces, and the result is that price differences might not act as may have been expected.

There is hardly any limit to the number of combinations open to the intracommodity spreader, but certain positions tend to be relatively popular, such as intercrop spreads of July soybeans against November, July cocoa against December, July world sugar against October, and May wheat against July.

Intercommodity Spreads

Some commodities are used for the same general purposes as others and therefore are interchangeable to a degree. The easier it is to substitute one for the other, the closer the relationship of their prices. Oats and corn are a case in point, as are hogs and cattle. Some traders may have observed historical ratios between the prices of related commodities such as silver and gold and may believe that undue widening or narrowing of the price difference may offer an opportunity. If a spreader believes that the price relation between two commodities is unrealistic, he can sell the higher-priced commodity, buy the lower-priced one, wait for the relative price levels to approach normality, and then take his profit. The advantages of trading in this manner are similar to those of intracommodity spreads. The margin on cattle against hogs is usually about the same as it would be for either hogs or cattle taken alone. This is greater than in the case of the intracommodity spread, in which the margin on the spread is considerably less than it would be on one side alone. Unlike the intracommodity spread, however, the intercommodity spread seldom involves a commission reduction when there is more than one commodity. Because drastic changes in the price levels of both commodities are likely to be similar, the risk of ruinous losses is considerably reduced at the cost of the opportunity to achieve windfall profits.

Among the more popular spreads of this kind are those involving soybeans and the products produced from the soybeans, namely, soybean oil and soybean meal. A spreader usually assumes that a crusher will find either oil or meal more profitable at a given time and that one of the product prices will be the stronger. If the current prices do not reflect the strength of one of the products adequately, the spreader can buy the product that she feels should be the stronger and sell the other against it. If she believes that the value of the two products combined is too low relative to the value of the beans, she can sell one contract of beans and buy one contract each of soybean oil and soybean meal. This position is usually called a "reverse crush" because it is opposite to the position taken by the soybean crusher, who is typically long on beans, which he crushes in order to be able to sell the products. A contract of oil plus one of meal does not exactly equal the amount of oil and meal that could actually be produced from the contract of 5000 bushels of beans, but it is usually close enough to yield a profit if the beans prove to be selling too high on the products. If the trader thinks that beans will gain on the combined products, she can buy the beans and sell the products, just as a crusher does. The establishment of such a position is sometimes called "putting on running time."

Other popular intercommodity spreads include wheat versus corn, hogs versus bellies or cattle, gold versus silver, long-term versus short-term financial instruments, and oats versus corn. Traders should make certain to note material differences in contract sizes or values to be sure that the sides are comparable. In the case of oats versus corn, for example, trades frequently spread one contract of corn against two contracts of oats because they consider a contract of oats to be worth only about 56 percent of a contract of corn.

Intermarket Spreads

Many commodities are traded on more than one market. Wheat is traded on the Chicago Board of Trade, the Kansas City Board of Trade, and the Minneapolis Grain Exchange. Chicago trades basically Soft Red winter wheat; Kansas City, Hard Red winter wheat; and Minneapolis, spring wheat. There is, however, a close relation among all these types, which are interchangeable for many purposes. In some cases the type trading on one exchange is deliverable against the type trading on another. All three basic types of wheat are deliverable on the Chicago Board of Trade. In this case the important limiting factors include the cost of transportation between cities, as well as differences in the characteristics of the different types of wheat. If speculators believe that price differences are out of line between commodities being traded in two cities, they sell the higher-priced contract and buy the lower-priced one. In spreads of this kind there is no commission advantage and seldom much, if any, margin advantage.

Popular positions include Winnipeg oats versus Chicago oats, New York cocoa and sugar against the London equivalents, Chicago against Kansas City or Minneapolis wheat, and New York gold or silver against Chicago or London.

Combinations

The fact that traders decide that Winnipeg oats are too low relative to Chicago oats does not mean that they should be long on *December* Winnipeg oats and short on *December* Chicago oats. If they think that oats are too high relative to corn, it does not follow that they should be long on *March* corn and short on *March* oats. The fact that they chose both contracts in the same delivery month may indicate that they have not thought enough about their spread positions. In most futures markets the nearby contract will gain on the distant in strong markets because of the influence of strong cash markets on the nearby contracts, and carrying charges will decrease or inversion will increase. During weak periods in such markets nearby contracts tend to lose on the distant, and carrying charges will increase or inversion will decrease. The long side of a spread trade should probably be the contract that is lowest-priced in terms of the prevailing spread differences in the commodity, and the short side should probably be the contract that appears highest-priced at that time. Traders should be careful to consider, however, that going to different delivery months will involve possible elements of change caused by variations in finance costs. They should also remember that bull spreads in some futures markets involve buying the spread and in others selling the spread. Nevertheless, for the best logical choice of both sides to be in the same delivery month would be sheer coincidence more often than not; yet this choice is all too often made by spreaders giving their positions only superficial thought.

Low-Risk Spreads

Many traders contemplating speculation in futures markets are in great fear of the risk involved. In order to reduce fear, many writers and speakers interested in attracting new commodity speculators are fond of discussing the "no-risk spread." The usual example given is an intracommodity spread being traded at the full carrying charge so that a trader can buy the nearby contract and sell the distant with virtually no risk at all except for a material change in the carrying charge. Actually, attractive opportunities of this kind are quite rare. Other traders will take spread positions before the contracts reach the full carrying-charge difference, with the result that the spreads may never get there. The closer the actual prices approach the apparent ideal, the more likely it is that there is such extreme weakness in the nearby lower-priced contract that there is no reason for it to gain on the distant contract. The low-risk trade, therefore, may involve little risk but will have little potential. Traders who wait for full carrying-charge situations involving real potential may spend a long time waiting for a trade that will never be made successfully.

Other more obscure examples of low-risk spreads involve combinations of positions now used primarily by professional traders and not too often by them. The butterfly spread involves three positions of unequal size in the same commodity. It is actually a spread of spreads with a common leg in the center. For example, one could be short one contract each of February and August pork bellies and long two May contracts. It will be noted that the inside leg is twice the size of and opposite in direction to the outside legs, or "wings." In the example given, the trader is said to be short the spread. If he were long the wings and short in the larger center position, he would be said to be long the spread. The latter position is sometimes referred to as a "sandwich spread."

A similar spread may be established with no common contract in the middle. An example would be short January bellies, long March, long May, and short July. This is sometimes referred to as a "condor spread."

If a combination of bull and bear spreads is applied to two closely related commodities rather than one, it is sometimes designated as a tandem spread. One might find such a spread utilized between cattle and hogs, hogs and bellies, Treasury bills and bonds, GNMAs and T-bonds, or other closely related financial instruments. For example, a trader may establish one spread position long on September Treasury bills and short on December bills and at the same time go short on September Treasury bonds and long on December bonds.

The low profit potential of such spreads and the difficulty of finding and recognizing realistically attractive opportunities have caused these spreads to be obscure, and they shall probably remain so except among highly sophisticated professional traders.

Tax Spreads

There were formerly large numbers of traders who entered spread positions primarily to achieve some tax advantage, such as postponement of gains to later years, conversion of short-term capital gains to long-term capital gains, conversion of ordinary gains to capital gains, or a combination of both favorable conversion and postponement. Combination spreads such as butterflies were especially popular for this purpose because of their extremely low risk. The profit potential in such trades was a secondary consideration, although traders were not averse to achieving a monetary gain in addition to their tax advantage if possible.

Low risk and the lack of predominant profit motive eventually attracted considerable displeasure from the Internal Revenue Service, which began disallowing such strategies over a decade ago. Current tax laws have caused the "tax spreaders" to try their luck elsewhere, but many cases resulting from disallowed trades were still wending their way through the courts long after the laws were changed.

Taxes were discussed briefly in Chapter 3, but detailed coverage of this subject is beyond the scope of this book and probably beyond that of some brokers and others who are sometimes too generous with advice in this complex and hazardous area. Because bad advice can lead to audits, disallowances, expense, and other forms of anguish, it might be wise to get advice from those best qualified to give it rather than from those with something to sell.

Problems

Although many of the traders who turn to spread trading do so with the expectation of finding it a simpler and safer approach to futures trading than is the trading of net positions, they may find themselves wrong on both counts. Not all the special problems encountered by spread traders can be discussed here, but some examples may help.

Many technicians rely heavily upon charts in selecting trades or in timing entrances to and exits from market positions. The chartist's first problem is determining what to put on the chart. For net positions, it is usual to indicate the opening, high, low, and closing prices of the commodity being monitored.

A trader interested in the price difference between two contract months of a commodity has a far more complex problem. The trader, may, of course, simply chart the two positions separately and attempt to learn by observation which of the two is acting stronger or weaker relative to the other. If it is considered more desirable to chart the spread difference itself by subtracting the price of one contract from the price of the other, it may be difficult or impossible to represent the differences realistically. Spread transactions are not indicated separately from net trades on any generally available quote system or in the columns of financial publications, so a considerable amount of guesswork becomes necessary. The differences between the closing prices or midranges of both contracts are often charted, but midranges may occur at quite different times and may represent materially different ranges, or both. The closing price of one or both of the contracts may reflect an aberration such as an unusually large order to buy or sell on the close of the market. This might result in a substantial change in the spread difference if closing prices are utilized for charting, but it would almost certainly be insignificant and correct itself at the opening of the market on the following day. There is really no way to judge from the day's ranges of the individual contracts where the spread was really being traded during the day and certainly no way of knowing whether volume in the spread was light or heavy. The lack of readily accessible data may make it impossible even to determine the ranges of spreads during the trading day. Spread quotes may or may not exist on trading floors.

It is quite common, and probably wise, for technicians to progress from "paper trading" into "real-world trading." In the case of spreads, even paper trading can prove quite difficult to evaluate among those not inclined to lie to themselves. How can they ever really know where a trade would have been entered? Unless a spread clearly widens or narrows well beyond their price objectives, can they ever be really sure that the positions could have been liquidated at a profit? If stops are to be utilized and the trade fails, how can the trader know with any reasonable accuracy what the liquidation price would have been?

If trading in the real world is begun, additional problems might arise that were not even considered during the planning stage. Futures markets may open or close at different times, so news may affect the commodity that is being traded, whereas the other side of the spread is in a future which is closed and therefore unable to respond to the same news. This may be serious during a closing period when news adverse to the spread may cause a severely aberrant close, which may result in a substantial margin call. If one side of the spread is in a foreign market, currency variations may add an additional element of risk.

Futures may have different trading limits, which means that traders may lose more on one side of a spread than they make on the other, with the result that they find themselves not nearly so well protected by being spread as they may have thought. Traders who are short on wheat and long on corn find small comfort in their spreads in a sharply rising market when they discover that they are making 10 cents per bushel per day on the corn while losing 20 cents per bushel per day on the short wheat.

Execution costs of spreads tend to be high and only partly because of the greater commissions incurred. More serious is the fact that spreaders entering a position have to enter the long side at the offer and the short side at the bid, although the existence of spread quotes on the exchange floor might reduce or eliminate this problem. When they liquidate, they may again face the same problem. This may not seem to involve particularly large numbers, but it may actually cause the profit from the spread to be materially less than had been expected. This must be added to the initial problem of predicting a realistic number of winning trades. The problem is further compounded if one leg of the spread is to be placed in a thin distant contract. This may be tolerable if the trade proves to be successful, but if it is stopped out, the resulting loss may be substantially greater than had been anticipated.

It is not unusual for traders to deal in both spreads and net positions. If such traders have an open position long on March wheat and short on May wheat and now get an indication that they should be long on May wheat, they face a whole new range of decision making.

None of this should be taken to indicate that spread trading cannot be done successfully, for that is not the case. Too often, however, spread trading is offered as a rather simple low-risk way of trading commodities which is especially good for the beginner. That is not the case either. Spread trading may be more difficult than net trading and may involve greater rather than less risk.

Mistakes

The most frequent mistake made by those who trade spread positions is establishing them for all the wrong reasons. A common example is the net position trader who has an open loss that continues to get worse until he receives a margin call. He could, of course, solve his immediate problem by reducing or eliminating his position, but for some reason he regards a realized loss as something so much worse than an open loss that he will do anything to avoid it. This error is so widespread and usually so disastrous that it is worth examining in some detail.

Presume that a cocoa trader is convinced that the price of May cocoa at $2528 per ton is such a bargain that it is worth the full use of his available trading capital of $6000. The margin requirement for one contract of 10 metric tons of cocoa at the brokerage house of his choice is $2000. He therefore buys three contracts of May cocoa at $2528 and waits for great wealth to come his way. Unfortunately, the news items concerning cocoa become unfavorable. Ghana announces that its crop looks better than had been expected. Holland and Germany speak of decreased consumption, and suddenly May cocoa is at $2414 and "not acting well." The trader is convinced that this adversity is temporary and that the forthcoming rise will be bigger than ever, and he wishes only that he could buy the cocoa now instead of when he did. Nevertheless, his broker's shortsighted margin clerk, concerned only with numbers, points out that the open loss is $3420 and that there is insufficient margin remaining to support three cocoa contracts.

The trader now has several choices. First, he could deposit additional funds, but he has none available for this purpose. Second, he could sell one cocoa contract and keep the other two, but he does not like the prospect of having to make $171 per ton on each of his two remaining contracts to compensate for the $114 open loss on each of the three contracts he has bought. Third, he could admit that he was wrong about the cocoa market and liquidate all three of his contracts. This he finds impossible to do because he would have a realized loss of more than $3400 in addition to the necessity of admitting to himself, his wife, his broker, and his accountant that he is not as good a trader as he would like to have them think. So he seeks a way to postpone the inevitable by buying time. Accordingly, he orders his broker to sell three contracts of July cocoa at its present price of $2375 a ton. The margin requirement on a cocoa spread is only $500 compared with the $2000 on a net long or short position, so his total margin requirement is reduced from $6000 to $1500. The equity in the account was reduced from $6000 to $2580 by the decline in May cocoa, so the margin call is easily satisfied by spreading the May cocoa against the new July position.

On close examination it should be apparent that the trader has not really improved his position and may have made it worse. He has reduced his margin requirement from $6000 to $1500, but he would have had no requirement at all if he had simply sold his May cocoa. His new plan, if he has one, is probably to cover his short July position after cocoa stops going down and take his "profit." It should be clear, however, that his position will be no better than if he had just taken off his May cocoa and reinstated it. It is probable that the May will drop just as much as July if July goes down, and therefore his July closed profit will be equaled by an additional May open loss. The commission expense of trading the three July contracts is just the same as that incurred in taking off the three May. The moment the July short position is lifted, the margin requirement reverts to $6000 and the trader has the same problem he had before because there has been no equity improvement. A common procedure for such people would be to take off July early one day and hope that May rises enough by the close to overcome the margin call—which, of course, might happen. Because the trend of cocoa has been down, however, it is at least as likely that cocoa will go down during the day and make matters worse. In the end he might trade his July cocoa several times, paying a commission of about $300 every time he does until he has a margin call even on the spread position and his situation has become hopeless. At this point he will probably blame the cocoa exchange, his broker, or his bad luck, when actually he was guilty of overtrading, failing to take a loss quickly, and spreading for the wrong reasons. Aside from a rally in the May futures on the day he covers his July position, the only other way out of his predicament is an improvement in the spread itself resulting from the May contract gaining materially on the July, but in a bear market the reverse is more likely. The chances of spreading a bad position and then recovering either by successfully day-trading one side of the spread or by seeing a material improvement in the spread position itself are extremely thin ones.

A second serious error common among spreaders is choosing a spread in preference to a net position primarily to reduce margin and then putting on such a large spread position, just because the margin is low, that they ultimately take more risk and pay more in commissions than they would have paid with a net position. Such traders fail to realize that a spread provides some but not complete protection. A spreader might consider a price difference warped and thereby offering an opportunity, but it might well become even more warped and result in a loss before it returns to normal, that is, assuming it was warped in the first place and did not merely reflect some condition overlooked by the spreader.

A corn trader, for example, may consider May corn cheap at $2.82 and consider the purchase of 5000 bushels for an anticipated 18-cent gain, for which she would risk a 6-cent loss. The required margin might be $750 and the round-turn commission $80. The gain would yield her a gross profit of $900 and a net profit of $820. The gross risk would be $300, and the total anticipated risk would be $380. The $820 profit would be about 109 percent of the margin required, but the trader concludes that she would do even better by spreading because her broker will carry 5000 bushels of May corn long against 5000 bushels of December corn short for only $250. She believes that the expected 18-cent gain in May corn will result in its gaining 9 cents on December corn during the same time, which would represent a potential net profit of $350, or about 140 percent on the $250 margin. The commission on the spread position of about $100 would be only slightly higher than the commission on the net trade and so would not materially overcome the benefits of a higher return, a lower margin, and risk, at least perceived, at a lower level.

This seems so attractive to the trader that she is reluctant to leave idle the remainder of the $750 margin that the net corn position would have required. She thereupon decides to utilize the same capital for the spread and puts on three of the spreads, or 15,000 long May corn against 15,000 short December. If her trade succeeds, she will realize a gross profit of $2700 less a total commission of about $180, or $2520 on her $750 margin. What she fails to consider is the effect of possible adversity. It is unrealistic to assume that one could be prepared for a possible loss of less than 5 cents on a spread of this kind, but some unexpected event like an adverse government report on the corn crop could easily cause a loss of 5 cents or even more. A 5-cent loss on the spread would be $750 plus the $180 commission, which would more than wipe out the trader's capital. This is a far greater loss than could reasonably have been suffered on a net position. As a result the apparently safer position with a smaller investment has become a far greater risk with an equal investment and a larger commission.

Even when a spread can be established on the basis of an available quote, some traders are tempted to establish a spread one leg at a time or to remove it one leg at a time. This has at least one clear disadvantage and usually two. The spread commission is lost. Instead of paying the spread commission of about $100 for a corn spread, for example, the customer must pay the full $80 for each side, or a total of $160 for both. Second, most traders have an uncanny ability to put on the wrong leg first or take off the wrong one first. This is so probably because most of them try to choose the exact moment that a market will turn, which is almost impossible to do. For example, suppose that the corn spread previously discussed has worked favorably and that May corn has gained the planned 9 cents on

December. The trader could take off the spread at the prevailing difference and realize her profit. She could also cover her December short and allow the May to continue to rise. Instead, she will probably yield to the temptation to take off the May because it is the profitable side and stay short on December, hoping that it will go down, overcome its paper loss, and allow her to show a profit on both legs of the spread. Actually, what seems to happen all too often is that the May side is taken off on a day when corn is strong, and it is that very strength which caused the spread to succeed. It is also taken off early in the day because the trader wants as much time as possible for December to react. So corn continues strong, and the 9-cent profit that was realized over a period of months is lost in hours.

A mistake that is not quite so serious, but quite common, is the haphazard choosing of contract months. The trader could have timed the transaction by watching a chart indicating the difference between May and December corn, but at the moment of entry July might be a better choice than May or March better than December. The choice should be based on all pertinent factors, not on the casual choice of contracts on a spread chart or a broker's quotation screen.

An error that may prove to be downright disastrous is the failure to realize the risk-reward consequences of being short on the nearby leg of an intramarket spread and long on the distant. This means that the potential reward of the trade is limited to the full carrying charge between the contracts utilized for the spread, whereas the risk of loss is virtually limitless. Selling the nearby leg in an inverted market may have merit if near-term weakening of the market is anticipated, but selling the nearby at a deep discount to the deferred contract may be extremely hazardous in some markets. Such positions are sometimes established by somewhat unsophisticated traders who believe all spread trades to be conservative. They were formerly sometimes used by traders spreading for tax purposes who did not always fully realize the risks of their positions.

NOTES FROM A TRADER

Spread trading is not so simple as taking net long or net short positions in a commodity. The advantages are sometimes so great, however, that it is well worth the time and energy needed to master them. Most spread positions involve less risk than net positions and frequently less investment. The extra commissions incurred are usually a small consideration compared with the advantages. The avoidance of catastrophic losses is one of the greatest advantages of spread trading. Futures markets sometimes have sudden violent price movements. When one of these movements is in favor of a trader, he realizes a welcome windfall profit, but when one is against him, he is no longer a futures trader. Many speculators with experience in trading are happy to forgo the opportunity for such windfall profits if the equal chance for a disastrous loss can be avoided. Spreads accomplish this reduction of risk because what is lost on one side in an unusually large adverse move is frequently matched by an approximately equal gain on the other side. The cost of this insurance against disaster is quite low. For a new trader spreads may provide an opportunity to enter the commodity markets with minimum capital and risk.

8 CHAPTER

Options

"Every new idea has something of the pain and peril of childbirth about it."

—*Samuel Butler*

DEVELOPMENT OF OPTIONS ON FUTURES

Exchange-traded stock options began at the Chicago Board Options Exchange (CBOE), an "offshoot" of the Chicago Board of Trade, during 1973. Exchange-traded stock options expanded in both the number of stocks covered and the trading volume, not only at the CBOE but also at the American Stock Exchange and some regional stock exchanges. Prior to the listing of exchange-traded stock options, there were over-the-counter options on stocks, but they never entered the mainstream of Main Street investments.

U.S. commodity options—that is, options on some agricultural products—were traded on U.S. futures exchanges but were prohibited in 1936. In the early and mid-1970s, options on futures contracts traded in foreign cities, mostly London, were traded in increasing volume in the United States. However, questionable sales practices and many allegations of fraud in these options received considerable press, and these options were banned as of June 1, 1979. The only commodity options then remaining were the so-called dealer options, which were options on physical commodities sold by those having a commercial interest in the underlying commodity. To continue in this business, dealers had to have been in the commodity option business as of May 1, 1978, and meet other requirements. Dealer options continue, but are small in coverage and volume.

The regulatory process for approving the trading of options on U.S. futures exchanges began on January 29, 1981, when the CFTC published proposed rules for a pilot program for exchange-traded options on non-agricultural futures contracts. These rules were adopted by the CFTC on November 3, 1981, and became effective on December 3, 1981.

Exhibit 8-1 shows the futures options contracts listed according to this program. The Treasury bond futures option, the gold futures option, and deutsche mark futures option, and, to a lesser extent, some other options contracts have proved successful.

EXHIBIT 8–1

Commodity Option Pilot Program

Exchange*	**Futures Contract**	**Date Listed for Trading**
Initial pilot:		
CBT	Treasury bond	October 1, 1982
Comex	Gold	October 4, 1982
CSC	Sugar	October 1, 1982
CME	S&P 500 Index	January 28, 1983
NYFE	NYSE Composite Index	January 28, 1983
KCBT	Value Line Index†	March 4, 1983
Second round:		
CME	Deutsche mark	January 24, 1984
Comex	Silver	October 4, 1984
CBT	Silver	March 29, 1985

* CBT—Chicago Board of Trade
CME—Chicago Mercantile Exchange
CSC—Coffee, Sugar & Cocoa Exchange
Comex—Commodity Exchange
KCBT—Kansas City Board of Trade
MCE—MidAmerica Commodity Exchange
MGE—Minneapolis Grain Exchange
NYCE—New York Cotton Exchange
NYFE—New York Futures Exchange

† Traded on the floor of the CBT.

During December 1982, the CFTC approved a pilot program for options on select nonagricultural "physicals" whereby each exchange could list one such option. Then during November 1983, the CFTC amended its programs for options on futures and options on physicals so that each exchange could list two options in either category rather than only one option in each category. As Exhibit 8-1 indicates, the CME (with an option on its deutsche mark futures contract) and Comex (with an option on its silver futures contract), which have been quite successful, and the CBT (with an option on its silver futures contract), which has not been successful, participated in this second-round program.

The next major step in the U.S. commodity options program occurred during late October 1984, when U.S. futures exchanges were allowed to trade options on two of their agricultural futures contracts. The agricultural futures contracts listed by the exchanges according to this program are shown in Exhibit 8-2.

The CFTC and Congress expanded the pilot program on nonagricultural futures and nonagricultural physical commodities (such as silver and gold) from two to five contracts on August 24, 1984. The contracts listed according to this expanded program are shown in Exhibit 8-3. This 3-year pilot program was scheduled to expire on October 1, 1985, but it was extended prior to that date. Subsequently, on April 29, 1986, the CFTC

EXHIBIT 8–2

Agricultural Commodity Option Pilot Program

Exchange	Futures Contract	Date Listed for Trading
CBT	Soybeans	October 30, 1984
CME	Live cattle	October 30, 1984
KCBT	Wheat (Hard Red winter)	October 30, 1984
MGE	Wheat (Hard Red spring)	October 30, 1984
MCE	Wheat	October 30, 1984
NYCE	Cotton	October 30, 1984
CME	Live hogs	February 1, 1985
CBT	Corn	February 27, 1985
MCE	Soybeans	February 8, 1985
MCE	Gold	August 17, 1984

EXHIBIT 8-3

Commodity Option Pilot Program

Exchange	Futures Contract	Date Listed
CME	British pound	February 25, 1985
CME	Swiss franc	February 25, 1985
CME	Eurodollar	March 20, 1985
CBT	Silver	March 29, 1985
CBT	Treasury note	May 1, 1985

voted to replace the pilot program on nonagricultural futures contracts and physical commodities with a permanent program. With respect to the separate 3-year pilot program on agricultural futures, which expires on January 25, 1987, the CFTC also voted to expand it from two contracts to five on April 8, 1986.

Another addition to the options program came on April 26, 1985, when the American Stock Exchange, through a CFTC subsidiary, listed an option on physical gold with a cash settlement. The Philadelphia Stock Exchange, through a CFTC subsidiary, listed an option on a "physical" 90-day Eurodollar on May 10, 1985. This Eurodollar option is based on cash settlement and is the first European-type option listed by an exchange, which means that the options cannot be exercised by the long prior to expiration.

The options market, which only a few years ago was regarded as a playground for speculation, has become widely accepted in the investment world. Options are traded on virtually all listed commodity contracts, stock indices, and in the interbank foreign exchange market. The application of option theory has given rise to a new field: financial engineering. Options can be created and combined to provide a limitless variety of financial payoffs and allow for highly sophisticated hedging techniques.[1]

The growth of the options markets in the United States is depicted in Figure 8-1.

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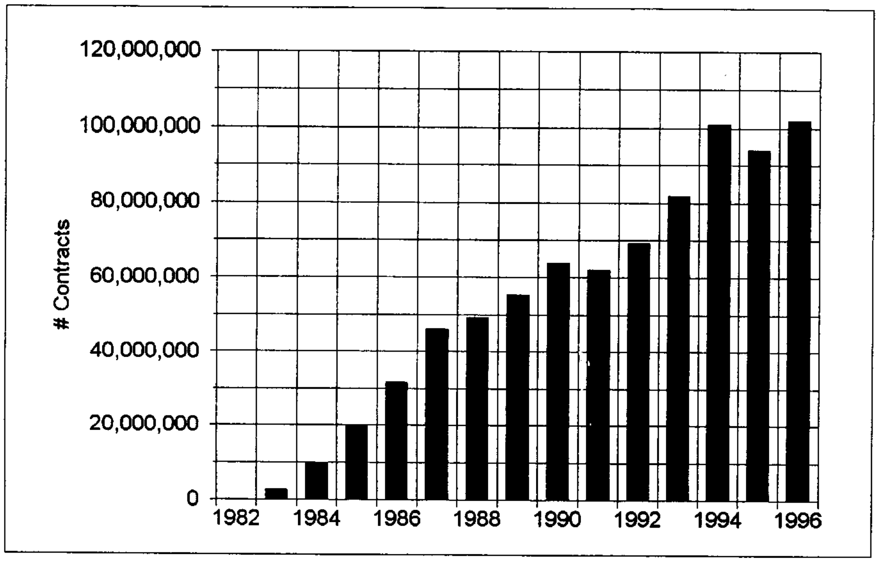
1. Richard M. Bookstaber, *Option Pricing and Investment Strategies* (Chicago: Probus, 1991), p. viii.

FIGURE 8-1

Options Volume, U.S. Exchanges, 1984–1997.



Source: Futures Industry Association

FUTURES VS. OPTIONS

Futures

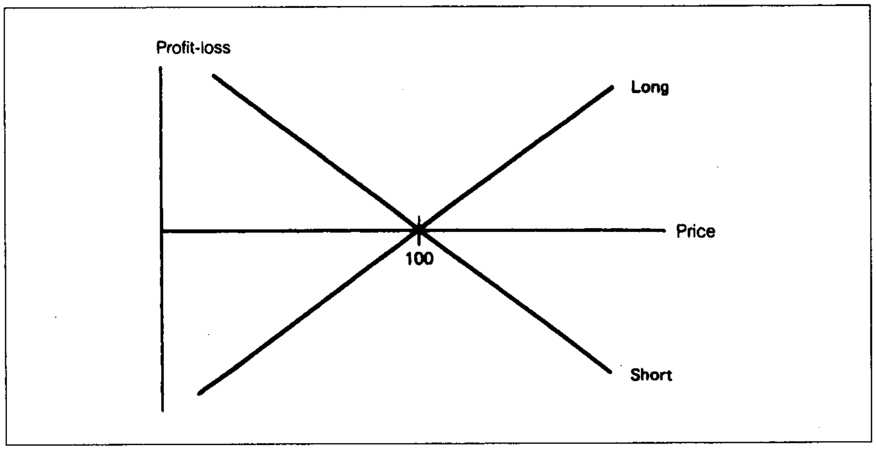
Futures are symmetrical; that is, the seller (short) and the buyer (long) are subject to symmetrical gains and losses. Figure 8-2 shows the potential profit and loss of long and short futures positions which were initially transacted at a price of $100. If the price increases from $100, the long profits by the amount of the price increase and the short loses this amount, and vice versa for a price decrease. Thus, the profits and losses for buyers are symmetrical.

Options

Buyers and sellers of futures contracts have for the most part similar rights and obligations. Prior to the delivery period, neither has the right to demand that the delivery process occur. During the delivery process, both have the obligation to participate in the delivery process. Options are by design asymmetrical—buyers and sellers of options have unequal rights

FIGURE 8–2

Profit-loss profile of long and short futures.



and obligations. The options buyer has the right to initiate the delivery process at any time, while the seller has the obligation to respond to the long's choice at this time.[2] Thus, the long is in a superior position because the long has the right and the short has the obligation.

This asymmetry leads to a true story of a conversation between a potential options customer and a broker. The potential customer asks the broker, "What's the difference between futures and options?" The broker, after a long pause, responds, "That's a complicated question, but I guess the main difference is that futures are symmetrical and options are asymmetrical." The customer quickly asks, "You mean that to trade options I have to learn the metric system?" Although options are more complicated than futures, learning the metric system is not necessary, and options do provide more speculative flexibility than futures, which makes it worthwhile to deal with this complexity.

There is a quid pro quo for this asymmetry. The long, to compensate the short for accepting this obligation, must pay the short a fixed amount of money at the time the transaction is made. The amount of this payment is called the option *premium* and is a market-determined price.

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[2] This is the case for "American" options. In "European" options the options buyer can initiate delivery only at the expiration or maturity of the options contract.

In the futures markets, neither the short nor the long pays the other; margin is only earnest money. If the underlying price remains the same, both the long and the short receive their margin back. In options, however, the buyer pays the seller for accepting the obligation mirroring the long's right. And if the underlying price remains constant, the short retains this amount, the option premium, and the long loses this "payment."

At this point it is necessary to introduce a third difference between futures and options. In futures, with symmetrical rights and obligations regarding delivery and payment, an investor can go long or short. In options, with asymmetrical rights and obligations, the long has the rights and the short has the obligations with respect to delivery. Given the asymmetry of rights and obligations with respect to options and consistent with the two sides of delivery—taking delivery and making delivery—there are two types of options: *calls* and *puts*. Calls permit buyers to call for or demand delivery at any time they choose. Puts permit buyers to put or make delivery at any time they choose.

Because options apply to the right of the long to take (call) or make (put) delivery, one other aspect of delivery must be specified. This aspect is called the "strike price." The strike price, which is independent of the current market price, is the price at which delivery is made from the short to the long, in the case of a call, or from the long to the short, in the case of a put. Options (both calls and puts), like futures, also have maturities, or dates on which trading in them ceases.

In futures, one may trade, for example, a March contract, on which one could go long or short. With options there are both March calls and March puts, each of which has various strike prices. For example:

March calls @ $100	March puts @ $100
March calls @ $102	March puts @ $102
March calls @ $104	March puts @ $104

Figure 8-2 shows a profit-loss profile for long and short futures positions. The profit-loss profile for each is symmetrical. For example, from any given initial price, if the price increases by $1, a long future profits by $1; if the price decreases by $1, the long future loses by $1.

THE DEVELOPMENT OF THE OPTION PRICING MODEL

In 1973, Fischer Black and Myron Scholes developed the first practical theoretical pricing model for options. Prior to this, evaluation methods required the solution of complex equations. Because the methods were slow and costly, a trader who tried to use them saw profit opportunities disappear before they could be identified.[3] The Black-Scholes equation is as follows:

$$C = e^{-\delta T} SN(d_1) - e^{-rT}EN(d_2)$$

where

$$d_1 = [ln\ (S/E) + (r - \delta + \tfrac{1}{2}\sigma^2)T]\sigma/T$$

and

$$d_2 = d_1 - \sigma \sqrt{T}$$
$$S = e^{-rT}F$$

The variables used are as follows:

C = value of call option
δ = cash flow rate
F = Futures price
E = Exercise Price
T = Time to expiration (years)
r = risk free rate of return
$N(\cdot)$ = normal distribution function
σ^2 = variance of futures price

The fact that the Black-Scholes equation has replaced other, more complex valuation models does not mean it is a simple formula. However, the equation clearly quantifies the effects of five factors on option premium:

1. *Strike price.* The higher the strike price, the less intrinsic value a call option has (opposite for a put option).
2. *Underlying futures price.* The higher the underlying futures price, the greater the intrinsic value a call option has (opposite for put option).
3. *Volatility of underlying futures price.* The higher the volatility, the more likely that an out-of-the-money option (put or call) will go into the money and, thus, have intrinsic value.
4. *Level of short-term interest rates.* Both call and put premiums decrease slightly as the short-term interest rate increases.

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[3] Sheldon Natenberg, *Option Volatility and Pricing Strategies* (Chicago: Probus, 1988), pp. 51–53.

5. *Time to expiration.* The longer the time to expiration, the greater the possibility that the underlying futures price will change such that the option (put or call) becomes "in the money" (i.e., has intrinsic value) and, thus, the greater the premium (put or call).

The call premium decreases as factors 1 and 4 increase, but increases as factors 2, 3, and 5 increase. The put premium increases as factors 1, 3, and 5 increase and decreases as factors 2 and 4 increase. The profit-loss profile of calls and puts will now be considered.

Calls

Consider calls first. Assume that we are dealing with a March call on a gold futures contract at a strike price of $400. Assume that the gold futures price is also $400 at this time. Assume that the price of this call, paid by the buyer to the seller, is $20. This price is called the call "premium."[4] The premium is determined in the same way that futures prices are determined: by bidding and offering on the exchange. The premium is the option price which is the counterpart to the futures price.

This premium exemplifies a fundamental difference between futures and options. In futures, there is no passing of money between the long and the short—both put up a margin, which is earnest money, not a payment. In options, however, the premium is paid by the buyer to the seller—the premium is truly a payment which the buyer transfers to the seller. If the underlying price remains constant, in the above example, the seller keeps this amount and the buyer loses it.

Note the profit-loss profiles of the long and the short in the above example. To do so it must be recognized that the long has the right to "call for" delivery of a (long) futures contract at any time prior to the option's expiration for $400, and the short, then, has the obligation to deliver the long futures at $400. The notification of the exchange by the long with regard to the desired delivery date is called an "exercise." The identification of the corresponding short by the exchange is called an "assignment." The expiration of the option occurs at the termination of trading. Although the long has the right to call for delivery at any time prior to expiration and

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[4] The premium is quoted in terms of the price of what underlies the futures contract. For example, if the price of gold is $400 per ounce, the premium will be quoted as $20 per ounce. But with 100 ounces of gold per futures contract, the total premium on one option will be $2000 ($20 per ounce × 100 ounces).

the short, then, has the obligation to make delivery, at expiration all outstanding long calls must be exercised or they expire and are worthless.

The exchange accomplishes the exercise and assignment in the above example by assigning the long call that is exercised a long futures contract at $400 and the short call to which it is assigned a short futures position at $400.[5] If, for example, the gold futures contract has a price of $420 at the time, the long futures position has an immediate profit of $20 and the short futures position an immediate loss of $20.

One important aspect of option prices or premiums should be recognized. Consider the premium of a gold futures call with a strike price of $400. Assume that the underlying futures price is $400. If the call is exercised, the exerciser will be assigned a futures contract at the strike price of $400. Because the underlying futures price is also $400, there will be no profit or loss as a result of exercise. This does not mean that the option price or premium will be zero. The call will have value during the time prior to the call's expiration because the futures price may increase above $400 and there would be a profit on exercise. This component of the option premium is called "time value."

An option's premium can thus be divided into two components: *time value* and *intrinsic value.* The intrinsic value is the immediate profit that would result from the exercise of an option. For a call, there is an immediate profit from exercise only if the underlying futures price is above the strike price of the call. For example, if the underlying futures price is $420, the exercise of a $400 call results in the assignment to the exerciser of a long futures position of $400. With the futures price at $420, there is an immediate profit of $20 due to exercise. Thus, the call has an intrinsic value of $20, but the option price will be greater than $20. There is an additional value to the call because the underlying futures price may increase above $420, giving the long call a profit even greater than $20. The value of the option premium in excess of $20 is called "time value." Thus, in this example, if the option premium is $30, the time value is $10 because the intrinsic value is $20.

An option which has intrinsic value, that is, whose underlying futures price is greater than the strike price, is said to be "in the money." If the underlying futures price were equal to the strike price, as in the above

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[5] The common methods of assignment are random assignment and assignment by the age of the short option, with the newest options being assigned first.

example when both were $400, there would be no intrinsic value to the option and the option premium would be entirely time value. An option whose underlying futures price is equal to the strike price is said to be "at the money."

Consider the third possibility—the case with the underlying futures price being less than the call's strike price. For example, assume that the underlying futures price is $380 for the call whose strike price is $400. If the buyer of the call exercised the call, he would be assigned a long futures contract at the strike price of $400. But because the underlying futures price is $380, he would have an immediate loss of $20.

The buyer of the call would, of course, not exercise the call in this case. The buyer of the call has the right to decide when and whether to exercise, and she would not exercise if the exercise would result in a loss. Instead, she would let the call *expire worthless.* A call whose underlying futures price is less than the strike price is said to be "out of the money." The buyer of a call which remains out of the money until expiration will allow it to expire worthless. The buyer's loss, then, will be what was paid to buy the call—the option premium. Obviously, the entire value of an out-of-the-money call, prior to expiration, is time value—it has no intrinsic value.

All options, prior to expiration, have time value. In-the-money options also have intrinsic value. At-the-money and out-of-the-money options have zero intrinsic value. The time value of an option is greatest when the option is at the money (futures price equals the strike price), and the time value decreases as the option goes more in the money (the futures price increases for a call, or the opposite for a put) or out of the money (the futures price decreases for a call, or the opposite for a put).[6]

Not surprisingly, the time value declines for in-the-money, at-the-money, or out-of-the-money options as the options approach maturity. Thus, as an option matures, its time value declines. The reason is that the less time there is remaining, the less the probability that the futures price will increase to give the option some value at expiration, or greater value at expiration. And all options with no time left until expiration have zero time value. The combination of time value and intrinsic value for in-the-money, at-the-money, and out-of-the-money options is summarized in Exhibit 8-4.

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[6] While few options traders understand the technical reasons for these facts, most do know them and act accordingly.

EXHIBIT 8-4

Intrinsic Value and Time Value of Options

	Calls		*Puts*	
	Time Value	**Intrinsic Value**	**Time Value**	**Intrinsic Value**
In the money	+	+	+	+
At the money	+	0	+	0
Out of the money	+	0	+	0

Now consider the profit-loss profile of a long call at various futures prices at the time of expiration of the option's contract, as summarized in Exhibit 8-5.

Consider, again, a call option on gold futures with a June expiration and a $400 strike price. Assume that the June futures contract is priced at $400 at the time the call is purchased (that is, the call is at the money) and that the premium paid by the long to the short for the call option is $20.[7]

Initially the long pays the short $20 for the call. Thus, the long loses $20 and the short benefits by $20 due to this initial purchase by the long and sale by the short. There may also be additional profits or losses realized by the long and the short at the expiration of the option's contract for various prices of the underlying futures contract.

Assume, first, that the price of the futures contract remains at $400 at expiration. Thus, the long call is assigned a long futures contract if he or she exercises, at the strike price of $400, and the short call is assigned a short futures contract at $400. Neither experiences a profit or loss due to only the exercise or assignment. Thus, there is a net profit of $20 to the short, due only to the $20 premium paid by the long to the short, and a net loss of $20 to the long, as seen in Exhibit 8-5.

Now assume that the futures price is $420 at expiration. The long call, if it is exercised, will be assigned a long futures contract at the strike price of $400 and the short call a short futures contract at $400. Thus, the

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[7] There are, of course, commissions on both futures and options on futures. These commissions are ignored in this chapter but, in practice, will not be ignored by your broker, and as a result, you cannot ignore them either.

long would experience an immediate profit, because of exercise, of $20 and the short a loss of $20. This profit and loss, however, are offset by the payment of the $20 premium from the long to the short, and, thus, on a net basis both the long call and the short call break even, as indicated in Exhibit 8-5.

Similarly, if the futures price is $440 at expiration, the long will profit by $40 at expiration due to exercise and the short will lose $40 due to assignment. After the $20 premium initially paid by the long call to the

EXHIBIT 8-5

Profit-Loss Profile of Call

A. Long Call

Futures price at option's expiration	Premium paid by long	Long's profit or loss at expiration	Net profit or loss by long
360	–20	0	–20
370	–20	0	–20
380	–20	0	–20
390	–20	0	–20
400	–20	0	–20
420	–20	20	0
440	–20	40	+20
460	–20	60	+40
480	–20	80	+60

B. Short Call

Futures price at option's expiration	Premium received by short	Short's profit or loss at expiration	Net profit or loss by short
360	+20	0	+20
370	+20	0	+20
380	+20	0	+20
390	+20	0	+20
400	+20	0	+20
420	+20	–20	0
440	+20	–40	–20
460	+20	–60	–40
480	+20	–80	–60

short call is netted out, the long call will have a net profit of $20 and the short call a net loss of $20.

The result can be extrapolated for any higher futures price at expiration. In general, longs will always exercise at expiration when the option is in the money. The profit to the long or the loss to the short is always equal to the ultimate futures price minus the strike price, with the profit to the long and the loss to the short due to exercise and assignment, minus the initial premium paid by the long to the short.

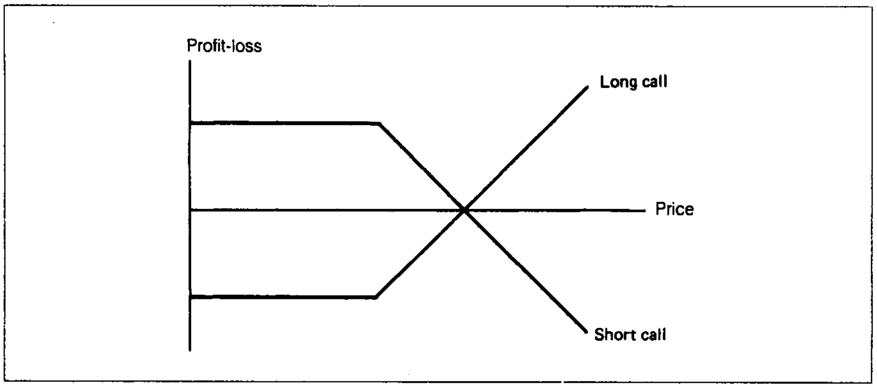
Consider next the futures price at expiration being less than the initial futures price. Assume that the futures price is $390 at expiration. If the long call is exercised, it will be assigned a long future at the strike price of $400. But because the futures price is $390, this will lead to an immediate loss of $10 to the long call and a profit of $10 to the short call. But this is where the asymmetry of options comes to the fore. The long, due to the quid pro quo for paying the option premium ($20 in this example), has the "option" of whether to exercise the call or not. And the long would not exercise an option if it led to an immediate loss of $10. The long, who has the choice or the option, would let the call expire worthless. Thus, the long would lose only the initial premium of $20. And the short would profit by only the initial premium of $20. In this case, the short would not actually realize the extra $10 in profit because the call would not be exercised.

In general, the long would never exercise an out-of-the-money call—a call whose strike price was greater than the underlying futures price—and would let it expire worthless. Thus, for out-of-the-money calls, the long would lose the premium initially paid to the short and no more. And the short would profit by the premium initially paid by the long and no more. The profit-loss profile for long and short calls is shown in Figure 8-3. There are asymmetries in these profiles. The long can lose no more than the initial premium but can profit by an unlimited amount, and the short can profit by no more than the initial premium but can lose an unlimited amount. These asymmetries result from the fact that the long can choose whether to exercise the option or not.

It is interesting to note, however, that the long call is a bull strategy (that is, it profits if the underlying futures price increases and loses if the futures price decreases) and that the short call is a bear strategy. But neither is like a long futures (which is a bull strategy) or a short futures (which is a bear strategy) because futures, whether long or short, have unlimited profits *and* losses, whereas the profits and losses of long and short calls are limited in one direction and unlimited in the other direction. These differences are illustrated in Figure 8-4 and summarized in Exhibit 8-6.

FIGURE 8–3

Profit-loss profile for long and short calls.



Long futures and long calls are both bull strategies, but long futures have both unlimited profits and unlimited losses, whereas long calls have unlimited profits and limited losses. There is a strategy that has the opposite, that is, limited profits and unlimited losses on the upside. Short futures and short calls are both bear strategies, but short futures have both

FIGURE 8–4

Profit-loss profile for calls and futures.

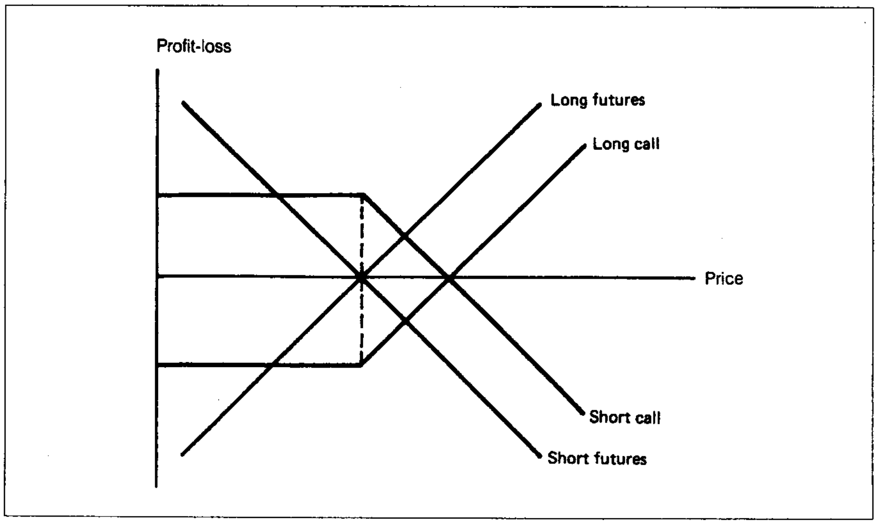


EXHIBIT 8-6

Profit-Loss Profiles for Various Strategies

		Profit or Loss			
	Type of Strategy	Price Increase	Price Constant	Price Decrease	Payment (–) or Receipt (+)
A. Basic Strategies:					
Future—long	Bull	Profit—unlimited	Break even	Loss—unlimited	0
Future—short	Bear	Loss—unlimited	Break even	Profit—unlimited	0
Call—long	Bull	Profit—unlimited	Loss—limited	Loss—limited	–
Call—short	Bear	Loss—unlimited	Profit—limited	Profit—limited	+
Put—long	Bear	Loss—limited	Loss—limited	Profit—unlimited	–
Put—short	Bull	Profit—limited	Profit—limited	Loss—unlimited	+
B. Combination Strategies:					
Straddle—buy	Volatility	Profit—unlimited	Loss—limited	Profit—unlimited	–
Straddle—sell	Stability	Loss—unlimited	Profit—limited	Loss—unlimited	+
Spread, vertical—bull	Bull	Profit—limited	Profit or loss—limited	Loss—limited	+ or –
Spread, vertical—bear	Bear	Loss—limited	Profit or loss—limited	Profit—limited	+ or –

unlimited profits and unlimited losses, whereas short calls have limited profits and unlimited losses. There is also a strategy that has the opposite, that is, unlimited profits and limited losses on the downside.

Both of these additional strategies relate to the other type of option: puts.

Puts

Calls enable the longs to *take delivery* from the shorts at the strike price. Puts enable the longs to *make delivery* to the shorts at the strike price. So for a put, the longs have the "option" of whether to exercise the put or not, and exercising means making delivery and collecting from the shorts an amount equal to the strike price. And for the put, the shorts take delivery at the strike price and pay an amount equal to the strike price if the longs exercise their options.

Consider the profit and loss possibilities for long and short put holders in the example above. A put on gold futures with a $400 strike price has a premium of $20 when the underlying gold futures price is also $400. The profit-loss profile for long and short puts as the gold futures price increases and decreases is shown in Exhibit 8-7.

As with the call, the long pays the short $20 for the put, that is, for the option of making delivery at the strike price of $400, which is independent of the underlying futures price. If the put option is exercised by the long, the long put is assigned a short gold futures contract at the strike price of $400 and the short put is assigned a long futures position at $400.

Consider the profit and loss possibilities for the long and short puts if the gold futures price remains at $400 at the put's expiration. In this case, if the long puts were exercised, they would be assigned a short futures contract at $400 when the underlying futures price was $400, for no profit or loss. Thus, the longs would be indifferent to exercising the puts or letting them expire worthless. This, in general, is the case for *at-the-money* puts or calls. If the exercise had been made, the shorts, who would have been assigned a long futures contract at $400 when the futures price was $400, would also break even.

Thus, overall, if a put is at the money at expiration, there will be no profit or loss to the longs or shorts due to exercise and assignment, but the longs will, in this example, have a $20 loss and the shorts a $20 profit due to the $20 premium paid by the longs to the shorts at the time the transaction was made.

EXHIBIT 8–7

Profit-Loss Profile of Put

A. Long Put

Futures Price at Option's Expiration	Premium Paid by Long	Long's Profit or Loss at Expiration	Net Profit or Loss by Long
350	–20	50	+30
360	–20	40	+20
370	–20	30	+10
380	–20	20	0
390	–20	10	–10
400	–20	0	–20
420	–20	0	–20
440	–20	0	–20
460	–20	0	–20
480	–20	0	–20

B. Short Put

Futures Price at Option's Expiration	Premium Received by Short	Short's Profit or Loss at Expiration	Net Profit or Loss by Short
350	+20	–50	–30
360	+20	–40	–20
370	+20	–30	–10
380	+20	–20	0
390	+20	–10	+10
400	+20	0	+20
420	+20	0	+20
440	+20	0	+20
460	+20	0	+20
480	+20	0	+20

If the futures price were $420 at expiration, the long puts, if they were exercised, would be assigned short futures positions at $400 when the futures price was $420. There would be an immediate $20 loss. In this case the longs would not choose to exercise. They would let the puts expire worthless and not lose due to exercise. They would, however, still have losses of $20 due to the premiums paid. On the other side of the transaction, the shorts would also have no profit or loss due to exercise and assignment, but they would have $20 profits due to the premiums received. Thus, the longs would have a $20 loss and the shorts a $20 profit, both due to the exchange of the $20 premium.

In general for a put, when the underlying futures price is above the put strike price, the put is said to be *out of the money* and the long will let it expire worthless rather than exercise it. In this case, the long will experience a loss equal to the initial amount of the premium and the short a profit of the same amount. The profit and loss of the short and the long, respectively, for any out-of-the-money puts are $20, as shown in Exhibit 8-7.

Assume that the futures price is less than the strike price—say $390—at the option's expiration. If the long puts are exercised, they will be assigned a short futures contract at $400. They will thus have immediate profits of $10. In this case the longs choose to exercise. On the other side of the transaction, the short puts will be assigned a long futures position at $400 when the futures price is $390, and there will be an immediate loss of $10. The short has no choice in the matter of whether the put is exercised.

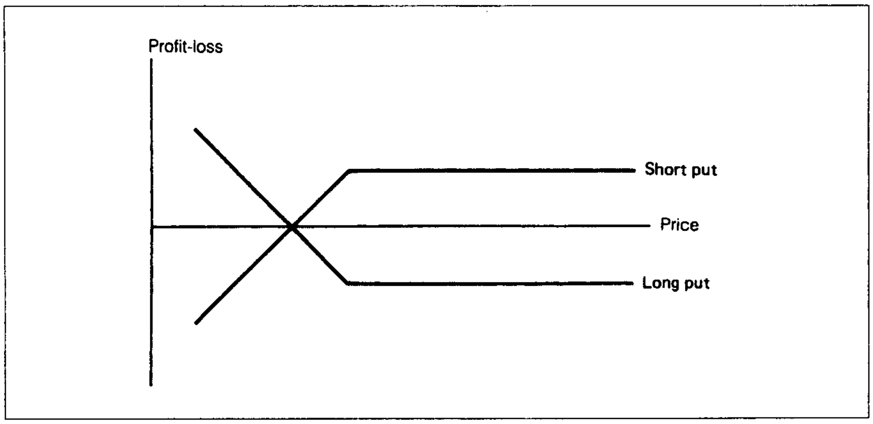
On a net basis, the long put has a $10 profit due to exercise, but because of the $20 premium paid for the option there is a net loss of $10. The short put loses $10 due to the assignment but receives $20 and so has a net profit of $10, as shown in Exhibit 8-7.

In general, if the futures price is below the put strike price at expiration, the puts are said to be *in the money,* and the longs will choose to exercise because they will profit due to the exercise. The amount of the long puts' profit will be equal to the difference between the strike price and the futures price. This will also be the amount of the short puts' loss. Of course, to get their net profit or loss, the $20 premium, which represents a loss to the long put and a profit to the short put, must be included. These results are shown in Exhibit 8-7 where the put is in the money, that is, where the futures price is below the strike price of $400. Figure 8-5 shows a graph of the profit-loss profiles of the long and short puts in this example.

Two observations can now be made which relate to the questions at the end of the last section. A long put is a bear strategy with unlimited profit potential if the market does move down and limited loss potential, the premium paid, if the market moves up. A short put is a bull strategy with limited profit potential if the market moves up and unlimited loss potential if the market moves down.

FIGURE 8–5

Profit-loss profiles of long and short puts.



Note also that a call is in the money if the strike price of the call is less than the underlying price and out of the money if the strike price is greater than the underlying price. Contrariwise, a put is in the money if the strike price is greater than the underlying price and out of the money if the strike price is less than the underlying price. In-the-money puts and calls will both be exercised by the long because it will be to the profit of the long to do so. Out-of-the-money puts and calls will both be allowed to expire worthless by the long because exercising them would cause a loss.

STRATEGIES

Calls, puts, and futures contracts provide various types of bull and bear strategies—that is, bull and bear strategies with various combinations of limited and unlimited profit and loss potential. These combinations are summarized in Exhibit 8-8.

Investors have considerable flexibility in choosing a strategy on the basis of their bullish or bearish sentiments, the strength of their sentiments, and their taste for or aversion to risk. We will consider separately various bull and bear strategies.

Bull Strategies

A long futures position is a bull strategy with unlimited profit and loss potential. If the market is flat, a long futures strategy breaks even. A long call is a bull strategy with limited loss potential but unlimited profit potential. But if the market is flat, this strategy experiences a loss equal to the premium paid in order to have the option to limit the loss due to adverse price moves. A short put is also a bull strategy, and it has a limited profit potential and an unlimited loss potential. But if the market is flat, there is a profit equal to the premium collected for giving someone else the option to limit the loss, which at the same time limits the profit potential of the short put.

Which of these three bull strategies is best? The answer to this question is an unequivocal "It depends." It depends on three factors.

First, it depends on the size of the option premium. If the call premium were zero, one would choose the long call with its unlimited profit potential and limited loss potential. As the premium increased, one's preferences would move toward the long futures and being subject to the unlimited loss, because for the long call there is a certain loss of the premium. And if the put premium were great, one might even sell a put to experience the profit equal to the put premium, even if the market stayed flat.

The choice also depends on risk tolerance. One who was completely averse to risk would not accept unlimited loss under any circumstances and thus would always buy a call and never buy a futures contract or sell a put to implement a bull strategy. This is the major reason why buying calls is so popular with many retail investors.

The third factor that determines the choice of one of the three bull strategies is the certainty of one's sentiments, in this case bull sentiments. If one thought that Voltaire's Dr. Pangloss ("All is for the best in this best of all possible worlds") was unduly pessimistic, one would be long on futures in order to experience every dollar of profit from the upward move, unreduced even by the call premium of a long call. Those who "sorta thought" the market would move up but were constantly looking over their shoulders to see if it would "tank" would probably use long calls so that they would not have to exercise their necks so much. And those who thought that the market would move up but would not be surprised if it remained flat might sell puts because it is the only bull strategy that shows a profit in a flat market.

Thus, even though there are three bull strategies, each has different profit and loss possibilities, and the choice among them depends on:

- The level of the call or put premium
- Risk tolerance
- The degree of one's bullish expectations

Bear Strategies

Similarly, there are three bear strategies: short futures, long puts, and short calls. With short futures there are unlimited profits in the downward direction and unlimited losses in the upward direction. If the market is flat, one breaks even. Long puts lead to unlimited profits but limited losses. But if the market is flat, there is a loss equal to the call premium paid to limit the loss. And for a short call, profits are limited but losses are unlimited. But if the market is flat, there is a profit equal to the put premium received.

The choice of the best bear strategy among the three depends on the same three factors on which the choice of the bull strategy depends.

COMBINATIONS OF FUTURES AND OPTIONS—THE TINKERTOY APPROACH

Basically, futures are rather simple instruments. You can "buy 'em or sell 'em." In either case you have unlimited profit and loss potential. Their relative simplicity results from this symmetry.

Options are more complicated. Long calls offer unlimited profits for price increases and limited losses for price decreases. Short calls have limited profits for price decreases and unlimited losses for price increases. Long and short puts are different from either of these. It is this lack of symmetry that leads to the relative complexity of options.

But as one usually "gets what one pays for," the complexity of options also leads to a richness or a greater variety of strategies. As we have already seen, long and short calls and long and short puts provide for a greater variety of bull and bear strategies, in terms of limited and unlimited profit and loss potentials, than long and short futures. This is one of the elements of richness that options provide.

The other aspect of richness that options provide results from the types of strategies which can be "built" with options. More strategies can be built with options than wooden structures can be built with Tinkertoy parts. Consider some of the things we can build with these "Tinkertoy" options.

Futures

The first things that can be built with options contracts are futures contracts. We can build either long or short futures contracts with combinations of calls and puts. Specifically, a long call and a short put is equivalent to a long futures position, and a short call and a long put is equivalent to a short futures position. For an illustration of these results, consider the options examples given in Exhibits 8-5 and 8-7.

Exhibit 8-8 shows the results of a combination of a long call, from Exhibit 8-5, and a short put, from Exhibit 8-7. Both long calls and short puts are bull strategies. Because the long call has unlimited upside profit and limited downside loss, and because the short put has limited upside profit and unlimited downside loss, the combination of these two has the same profit-loss profile as a long future.

That the combination of a long call and a short put is equivalent to a long future is shown in part A of Exhibit 8-8. Column 4 in part A shows the sum of column 2 (for a long call) and column 3 (for a short put). The outcome in column 4 is the same as for a long future—that is, a dollar-for-dollar profit for increases above the initial price of $400 and a dollar-for-dollar loss for price decreases below $400. Thus, by connecting a long call to a short put one can build a long future.

Note that in this example the call and the put both had the same strike price, and both were initially at the money. If the initial futures price was not such that the call and put would be at the money, one could build something very close to, but not exactly the same as, a long future out of the near-the-money call and put. The effective delivery month of the future built is the same as the expiration months of the call and put used.

One could also build a short futures position—a bear strategy—out of a short call and a long put—both bear strategies. Column 4 in part B of Exhibit 8-8, which shows the sum of column 2 (for a short call) and column 3 (for a long put), has the same profit-loss profile as a short futures contract.

Thus, futures contracts can be built from combinations of options contracts. So puts and calls can be used not only in their own right but also to build futures contracts. One may still choose to use futures contracts. But issues such as margins and pricing may affect this choice.

Puts from Calls and Futures

Because futures can be built from puts and calls, it should not be surprising that one can build puts from calls and futures and calls from puts and futures.

EXHIBIT 8–8

Combinations of Options

A. Combination of Long Call and Short Put

(1) Futures Price at Option's Expiration	(2) Net Profit or Loss for Long Call	(3) Net Profit or Loss for Short Put	(4) Net Profit or Loss for Long Call and Short Put
350	–20	–30	–50
360	–20	–20	–40
370	–20	–10	–30
380	–20	0	–20
390	–20	+10	–10
400	–20	+20	0
420	0	+20	+20
440	+20	+20	+40
460	+40	+20	+60
480	+60	+20	+80

B. Combination of Short Call and Long Put

(1) Futures Price at Option's Expiration	(2) Net Profit or Loss for Long Call	(3) Net Profit or Loss for Short Put	(4) Net Profit or Loss for Long Call and Short Put
350	+20	+30	+50
360	+20	+20	+40
370	+20	+10	+30
380	+20	0	+20
390	+20	–10	+10
400	+20	–20	0
420	0	–20	–20
440	–20	–20	–40
460	–40	–20	–60
480	–60	–20	–80

For example, one can build a long put by combining a long call and a short future. This is shown in Exhibit 8-9, wherein column 4 shows the sum of column 2 (the profit-loss profile for a long call) and column 3 (the profit-loss profile for a short future) and is the same as the profit-loss profile for the long put as shown in Exhibit 8-7.

EXHIBIT 8–9

Building a Long Put—Numerical Representation

(1) Futures Price at Expiration	(2) Net Profit or Loss for Long Call	(3) Net Profit or Loss for Short Future	(4) Net Profit or Loss for Long Call and Short Future
350	–20	+50	+30
360	–20	+40	+20
370	–20	+30	+10
380	–20	+20	0
390	–20	+10	–10
400	–20	0	–20
420	0	+20	–20
440	+20	–10	–20
460	+40	+60	–20
480	+60	–80	–20

Positions can be combined not only numerically, as shown in Exhibit 8-9, but also graphically, as in Figure 8-6, which shows how a long call and a short future can be combined to form a long put. In fact, calls were listed on stock options prior to puts, but traders were able to "convert" a combination of a long call on the stock with a short position in the stock into a long put on the stock—this was called a "conversion."[8]

Similarly in futures options, the four types of options can be built by the combinations indicated below:

Long put = long call + short futures
Short put = short call + long futures
Long call = long put + long futures
Short call = short put + short futures

Other Strategies

We have shown that long and short futures can be built from combinations of puts and calls and long and short puts and calls from calls, puts, and

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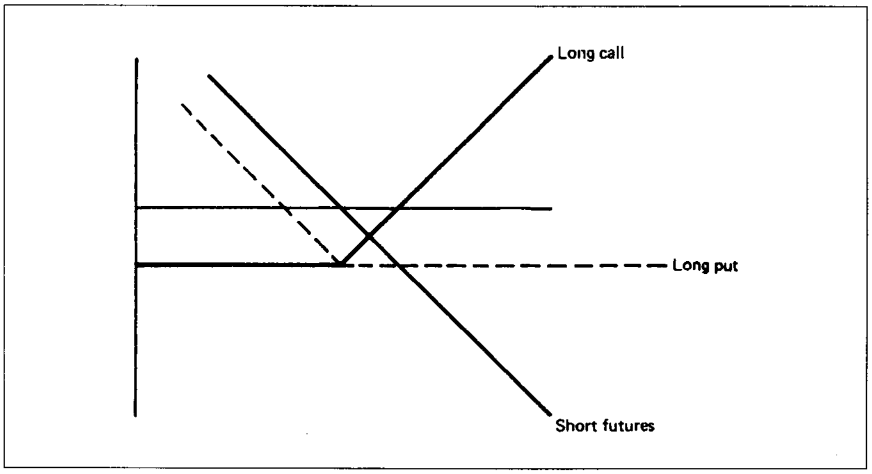
[8] Conversions and the opposite—reverse conversions—are also used as arbitrage strategies by professionals.

FIGURE 8–6

Building a long put—graphical representation.



futures. But that is not so exciting. It brings nothing new to the party.[9] Now we can show, however, that we can use our "Tinkertoy" options to build entirely new types of strategies, that is, strategies with entirely new types of profit-loss profiles. Many such strategies can be built. The most common are discussed in this section.

Straddles A "straddle" is a combination of either (1) buying a call and buying a put (called a "buy straddle") or (2) selling a call and a put (a "sell straddle") of the same strike price and month. Consider the buy straddle first. In terms of the above examples, assume that both the call and the put were bought with $400 strike price when the price of the underlying futures was $400. The premium for both the call and the put was $20, so the buyer of these two options had to pay $40 for the combination.

The profit-loss profile for this buy straddle is shown numerically in Exhibit 8-10 and graphically in Figure 8-7. The buy straddle shows a loss if the price is flat or relatively flat. Specifically, there is a loss for futures prices between 360 and 440, with the maximum loss of 40 if the market is flat at 400. If the market increases above 440 or decreases below 360, there is a profit, which is unlimited. Thus, this strategy loses

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[9] But at times you accomplish one of these at a cheaper price than that of the alternative.

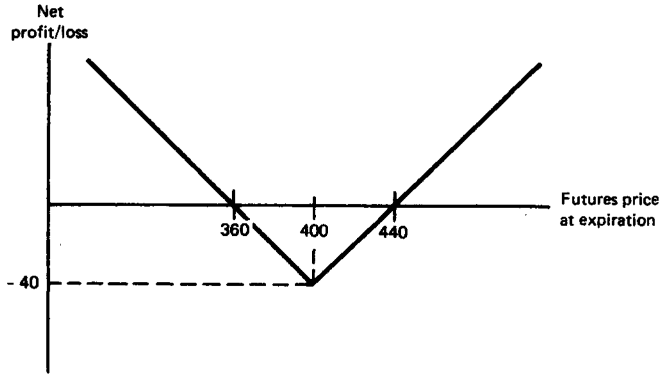
EXHIBIT 8–10

Profit-Loss Profile for Buy Straddle—Numerical Representation

Futures Price at Option's Expiration	Profit or Loss for Long Call	Profit or Loss for Long Put	Net Profit or Loss for Long Call and Long Put
350	–20	+30	+10
360	–20	+20	0
370	–20	+10	–10
380	–20	0	–20
390	–20	–10	–30
400	–20	–20	–40
420	0	–20	–20
440	+20	–20	0
460	+40	–20	+20
480	+60	–20	+40

FIGURE 8–7

Profit-loss profile for buy straddle—graphical representation.



if the market is stable and profits if the market moves sharply, either upward or downward. For this reason, the buy straddle is sometimes called a "volatility spread."

A sell straddle consists of selling both the call and the put considered above. The profit-loss profile for the sell straddle is shown in Exhibit 8-11 and Figure 8-8, numerically and graphically, respectively. The sell straddle, not surprisingly, has the opposite profile of the buy straddle. It shows a profit if the price stays flat or relatively flat. Specifically, it shows a profit for prices between 360 and 440, with the maximum profit of 40 (the amount of the premium initially received) at the initial price of 400. If the price increases above 440 or decreases below 360, there is a loss, which is unlimited. This strategy shows a profit in stable markets and a loss when markets are changing in either direction. It could be called a "stability spread."

Straddles add both stability and volatility strategies to our previous list of bull and bear strategies.

Spreads In futures, while there are many types of spreads, the most common type of spread involves buying one delivery month and selling another delivery month of the same contract.

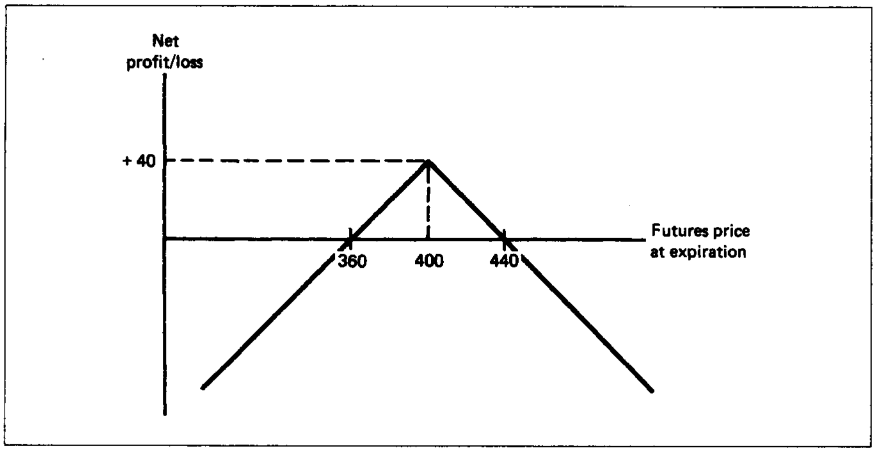
EXHIBIT 8–11

Profit-Loss Profile for Sell Straddle—Numerical Representation

Futures Price at Option's Expiration	Profit or Loss for Short Call	Profit or Loss for Short Put	Net Profit or Loss for Short Call and Short Put
350	+20	–30	–10
360	+20	–20	0
370	+20	–10	+10
380	+20	0	+20
390	+20	+10	+30
400	+20	+20	+40
420	0	+20	+20
440	–20	+20	0
460	–40	+20	–20
480	–60	+20	–40

FIGURE 8-8

Profit-loss profile for sell straddle—graphical representation.



In options, these same general types of spreads exist, but since there are two types of options, calls and puts, there can be both call spreads and put spreads of these types. To give examples of these, assume that for the gold futures options above, there are both options on the June futures contract (June options) and options on the September futures contract (September options). Assume also that there are puts and calls with $400 strike prices for these months, as summarized below:

June 400 call	June 400 put
September 400 call	September 400 put

There are two types of spreads between months involving both calls and puts, as summarized below:

Call Spreads (Horizontal)

Sell June 400 call/buy September 400 call
Buy June 400 call/sell September 400 call

Put Spreads (Horizontal)

Sell June 400 put/buy September 400 put
Buy June 400 put/sell September 400 put

These call and put spreads are referred to also as "calendar spreads" or "horizontal spreads." They are not clearly bull, bear, neutral, or nonneutral strategies but strategies that, more subtly, hope to profit from the more or less rapid decay of the time value of the nearby option rather than the deferred option. The profit-loss profiles of these horizontal spreads are not shown here.

There can also be options spreads with the same delivery month but across strike prices. Assume that with the puts and calls considered above there are also puts and calls available with $420 strike prices. With the initial $400 futures price, the $420 strike price call would be out of the money and the $420 strike price put would be in the money. The various June contract combinations available are summarized below:

June 420 call	June 420 put
June 400 call	June 400 put

The types of spreads across strike prices that are possible with these options are:

Call Spreads (Vertical)

Buy 420 call/sell 400 call
Sell 420 call/buy 400 call

Put Spreads (Vertical)

Buy 420 put/sell 400 put
Sell 420 put/buy 400 put

These spreads across strike prices are called "vertical spreads." Each of them is either a bull strategy or a bear strategy. But what is new about these vertical spread strategies is that whether bull or bear, they all have both limited profit and limited loss potential, something none of the strategies considered heretofore have had.

To consider the profit-loss profiles of these spread strategies, assume that initially the underlying futures price is $400 and that the premiums of the options are as follows:

Option	*Premium*
420 call	$5
400 call	$20

400 put	$20
420 put	$25

On the basis of these premiums, the profit-loss profiles of the four vertical spreads indicated above are calculated in Exhibit 8-12 and shown graphically in Figure 8-9.

As shown, the sell 420 call/buy 400 call (Exhibit 8-12, part B) and sell 420 put/buy 400 put (part D) are bull strategies with maximum profits

EXHIBIT 8–12

Calculation of Profit-Loss Profiles of Vertical Spreads

	Premium	350	400	420	450
A.					
Buy 420 call	–5	0	0	0	+30
Sell 400 call	+20	0	0	–20	–50
Net premium	+15	—	—	—	—
Net on exercise	0	0	–20	–20	–20
Net profit or loss	+15	+15	–5	–5	–5
B.					
Sell 420 call	+5	0	0	0	–30
Buy 400 call	–20	0	0	+20	+50
Net premium	–15	—	—	—	—
Net on exercise	0	+20	+20	+20	+20
Net profit or loss	–15	–15	+5	+5	+5
C.					
Buy 420 put	–25	+70	+20	0	0
Sell 400 put	+20	–50	0	0	0
Net premium	–5	—	—	—	—
Net on exercise	+20	+20	0	0	0
Net profit or loss	+15	+15	–5	–5	–5
D.					
Sell 420 put	+25	–70	–20	0	0
Buy 400 put	–20	+50	0	0	0
Net premium	+5	—	—	—	—
Net on exercise	–20	–20	0	0	0
Net profit or loss	–15	–15	+5	+5	+5

of 5 and maximum losses of 1.5.[10] The buy 420 call/sell 400 call (Exhibit 8-12, part A) and buy 420 put/sell 400 put (part C) are bear strategies with maximum profits of 15 and maximum losses of 5. These vertical spread strategies have both limited profit and limited loss potential.

This section on other strategies has considered buy and sell straddles and bull and bear vertical spreads (with puts and calls). The profit-loss profiles of the strategies considered are also summarized in Exhibit 8-6. There are other more complicated strategies involving combinations of puts and calls that are not considered here.

OVERVIEW AND CONCLUSIONS

Because of their symmetry, futures are relatively easy to comprehend. Primarily because of their asymmetry, options are more difficult to comprehend and apply. The reward for wading through and conquering this difficulty, however, is a much richer menu of strategies involving not only neutral and nonneutral as well as bull and bear strategies but also combinations of unlimited and limited profit and loss possibilities.

This richer menu, however, puts an added responsibility on investors. They must more explicitly specify their taste for profits versus their tolerance for risk. That is, they must more specifically know "what they're about" in an investment sense.

NOTES FROM A TRADER

One of the most consistent phenomena in finance is the trade-off. Efficient markets demand a price for any real benefit. This concept also applies to the options markets. The opportunity for a profit requires payment in the form of risk. Reduction of risk will almost certainly reduce the chance for a profit.

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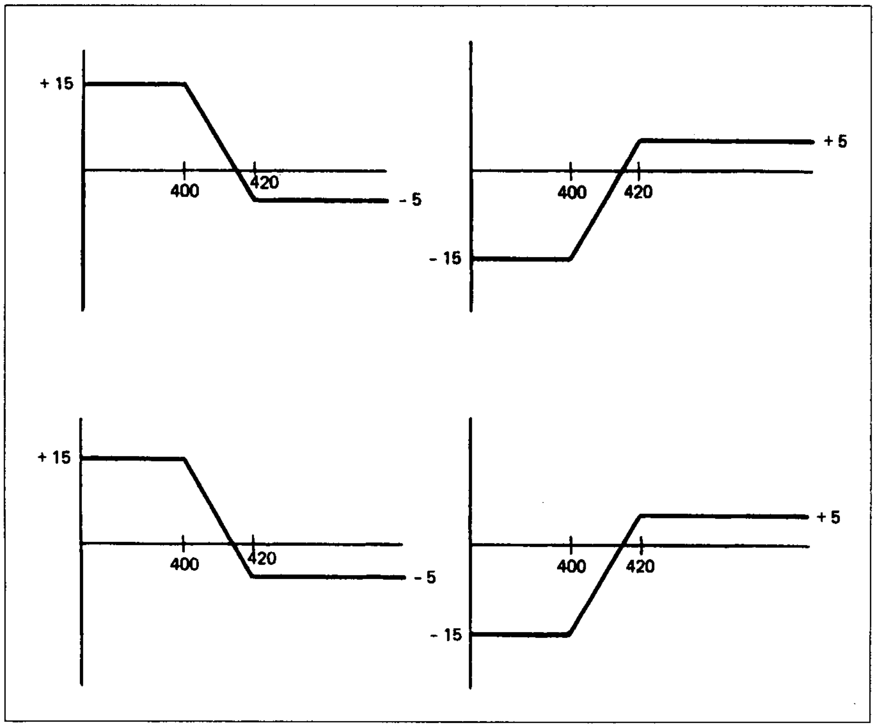
[10] Note that even though the sell 420 call/buy 400 call spread (strategy B) and the sell 420 put/buy 400 put spread (strategy D) are both bull spreads with maximum profits of 5 and maximum losses of 15, they are not fully equivalent. In strategy B, the spreader collects 5 for selling the 420 call and pays 20 for buying the 400 call, thus paying a net 15. Since there is a net payment, this spread is called a "debit spread." On the other hand, in strategy D, the spreader collects 25 for selling the 420 put and then pays 20 for buying the 400 put, thus collecting a net 5. Since there is a net collection, this spread is called a "credit spread." So the initial amount that must be put up to do these two spreads differs. Debit and credit spreads are also margined differently, but that topic is not considered herein.

FIGURE 8–9

Profit-loss profiles of vertical spreads. (a) Buy 420 call/sell 400 call; (b) sell 420 call/buy 400 call; (c) buy 420 put/sell 400 put; (d) sell 420 put/buy 400 put.



A major advantage frequently claimed for options by brokers of these instruments is the protection to the buyers of options against margin calls caused by sharply adverse market moves. The terror of margin calls due to a series of unfavorable limit moves is eliminated.

This advantage is bought only at a price, however. The option buyer starts with a loss, i.e., the premium paid for the option. Holders of futures contracts who liquidate their contracts at the same prices at which they were entered lose only commissions. Given the same circumstances, however, option buyers lose their premiums (at least the time value of the premium) as well as commissions. In effect, they have entered a race starting behind the starting line. The price of a loss limitation is the higher probability of losing.

On the other hand, sellers of options contracts collect rather than pay a premium, but the price for starting ahead of the starting line is being subject to margin calls in the event of adverse market moves. Nevertheless, more sophisticated speculators typically exhibit a preference for selling options and collecting premiums, even though they are subject to margin calls, rather than buying options and paying premiums.

Options have many uses. But the fundamental aspect of options is that the long option, whether a long put or a long call, has a limited loss—no more than the initial premium paid can be lost. On the other hand, short options have unlimited loss—in this sense short options are like futures contracts. Thus, the premium paid by the trader who is long an option is the price of being able to sleep at night. For this reason, many traders will never be short an option. On the other hand, the pros have a bias toward the short option side—they will accept the unlimited downside to collect the premium.

Options can be used as a substitute for stop orders. For example, if traders have an acceptable profit in a long futures position, they can put a stop order in at a somewhat lower price. Alternatively, they can buy a put to protect their profits. A major difference between these two approaches is that if prices reverse and decline to the lower level and then again increase, the trader is out of the market during the final period of price increase if a stop order is used but still in the market if a long put is used. On the other hand, the trader must pay the premium on the put. For example, a trader who holds a long gold futures position at a price of $400 could buy a $400 put for protection against losses. But the put premium must be paid. This combination of a long futures and a long $400 put is equivalent to a long call at $400. Similarly, to protect a profit on a short futures position, the trader could buy a call. The use of long puts and calls to protect the profits in futures positions may make the rule "never hold a position going into a report" obsolete.

Options can also be used when futures contracts are at their price limits because options contracts have no price limits. For example, if a trader has a long futures position and the market is limit down, the trader can buy a put and exercise the put, which gives the trader the right to a short futures position, which then makes the trader flat. However, the cost of this transaction may be high. First, the put premium includes time value, and the early exercise deprives the holder of the long put of this time value. To avert this loss, the trader could simply hold the long put until the next day on which futures trading commences and liquidate both the put and the futures contract. Even then, the price of the put at the time it is bought will be based not on the limit price of the futures contract but on the market's assessment of what the equilibrium futures price is. For example, if Treasury bonds were locked at a limit of 77-00 but the market assessment of the equilibrium price were 76-16, the price of the 78 put would include 1-16 of intrinsic value consistent with the assessed 76-16 price, not 1 point of intrinsic value consistent with the 77-00 limit price, plus the corresponding time value. For example, on February 28, 1983, the April gold futures contract closed limit down at $423.70, the April $480 put hit $80, and the April $500 hit $110. Thus, if traders had bought and exercised the $480 put, the effective liquidation price of the long futures position would have been $400, and the effective liquidation price of the futures contract with the $500 put would have been $390. Both are significantly less than the $423.70 limit-down price. These differences represent the amount by which the market's perception of the equilibrium price was less than the $400 price limit and also the initial time value of the options. In this regard, the options premiums give an indication of the market's assessment of the equilibrium futures price—however, an adjustment must be made for the time value of the option.

It should also be expected that when futures are at their limit, the liquidity of the options contracts may be less because the futures contracts will not be available against which to arbitrage. Finally, many futures contracts have spot month contracts which are traded without price limits and can be used even when the other contract months are at their limits.

Options may also be used to reduce margin requirements. While the premium must be paid for long options, short positions are margined, and some mixed strategies such as vertical spreads may require no margins.

9 CHAPTER

The Game Plan

"Games lubricate the body and the mind."

—*Benjamin Franklin*

INTRODUCTION

This chapter is not for everyone. There are those who do not like to follow plans. It's their money. Others are not able to follow plans. All such people are not wrong. Some trade intuitively and make little or no money but enjoy what they are doing. Others make enough money often enough to indicate that their intuition has value. It seems logical to some that such intuitive trades are based on input and that the input could be quantified. Those who trade in this manner, however, are often unable to indicate just what factors cause them to enter or exit trades exactly when they do and credit some extraordinary sensitivity which they cannot articulate. Most people do not claim to have this inherent timing ability, however, and so have a choice of following a plan or trading haphazardly. Those among this less fortunate group should read on.

Many traders find themselves in a position like that of the German High Command when it faced its adversary across the Channel during World War II. The invasion of Britain was planned but never executed, whereas the Battle of Britain was executed but never planned. Similarly, many futures traders seem to go through life planning trades they never execute and executing trades they never plan. The preceding chapters in this part have dealt with various elements of the decision-making process of futures trading. The objectives of the individual trader and the size of his or her initial capital commitment were analyzed in Chapter 5, which deals with risk and rewards, and the trade selection process was thoroughly discussed from the fundamental and technical approaches. The tasks that remain are to synthesize specific information into a game plan that will provide for any eventuality in a trade and to complete the consideration of the elements of money management begun in Chapter 5.

Bernard Baruch, who was no mean trader in his own right, knew the danger of arguing with numbers. He was fond of pointing out that two and two equals four. Once he said that "two and two make four and no one has ever invented a way of getting something for nothing."

Many speculators less intelligent than Baruch, and much less prosperous, seem to go through life unaware of this simple truth. They take positions based on impulse instead of reason and then wait to get lucky. They have not learned that even the best speculators consider themselves fortunate to be right on most trades or even to make significant profits during most years. Some traders find that their trading has resulted in more losses than profits, that the size of their average loss exceeds the size of their average profit, and that execution costs and commissions must be added to their losses and subtracted from their profits. Such traders eventually learn that two and two equals four.

The speculator has no more hope of winning on every trade than the gambler has of winning on every roll of the dice or every turn of the cards. The gambler learns to use words like "maybe," "usually," and "perhaps," and the speculator should learn the same. The speculator can no more know all the contingencies of determining price change than a card player can know the makeup of every hand before the cards are dealt.

If speculators plan their trades properly, it is at least possible for them to have the odds on their side in the long run, which is something few gamblers who do not own casinos can hope to achieve. Over a long period the skilled speculator who follows a well-thought-out plan in a disciplined manner may well have favorable results. Any gambler can win in the short run, but in the long run probabilities prevail and most will lose. No reasonable person would expect good luck to prevail and skill to fail for long periods—at least not so long as two and two still makes four.

Although not universally considered even by skilled traders, the disciplined use of good plans is widely credited by many as one of the most important reasons for their success. In the following pages the manner of developing a plan and the elements it should contain will receive careful consideration. Mistakes in formulating as well as implementing such a plan will be noted so that losing tactics may be avoided. It should be evident, however, that no chapter in this book or any other, no tract, nor any lecture can make successful futures traders out of everyone. There is a considerable amount of art, and perhaps luck, that affects results, and so no simple set of rules can ever guarantee profits. Furthermore, if every trader became successful, there would be no losers to provide the profits acquired by the winners.

THE BROAD PLAN

Reduced to its most basic elements, the trading plan provides the reasons for logically entering and getting out of any position, whether or not it proves ultimately profitable. Once a position is taken in the markets, a price level can do nothing but rise, fall, or remain unchanged, and a trading plan must provide a blueprint for entering a trade and establishing the action to be taken by the trader in *any* of the *three* eventualities.

Although there are several key elements of a game plan to be considered, the core of a plan must indicate, unequivocally, how the trader is to exit from trades that have been entered. Such an approach consists of not one exit plan but three. There must be a plan for accepting losses if a position shows adversity, a plan for accepting profits, and a plan for getting out of a trade if the price change over a significant period is negligible.

The most efficient procedure for exiting from a trade that shows a loss is by means of a stop-loss order if the trader knows how much adversity he is willing to absorb. If he has decided before entering the trade how much loss is acceptable, all he has to do is place a stop-loss order at that point. If the logical exit point is known, failure to place a stop-loss order is almost certainly foolish and may well lead to disaster.

If a trade shows a profit, the guidelines to the trader who is composing a game plan are not nearly so clear-cut. Several possibilities exist, and a case can be made for each of them. If the trader has decided upon her objective before entering the trade, the obvious procedure is to enter a limit order immediately to exit at that objective. Trading by price objectives may not, however, suit a trader who uses other methods of trade selection. A trader need not be a trend follower to believe in letting profits run until some gauge, technical or fundamental, gives a "signal" for opposite action. In this case the exit plan might read, "sell at the stop-loss point or when Indicator X gives a sell signal, whichever comes first."

One method of trading calls for holding a position until a certain amount of time has passed and then accepting whatever profit or loss exists. This may work well if a trade is profitable, but given enough time, the loss on a trade may approach the national debt. It would appear that this approach works best, if at all, only for positions which are to be held for short periods.

Whatever plan for accepting profits is used, a vital consideration is that the trader recognize that accepting profits is ultimately the name of the game. Unless he decides to replace judgment with luck, he should have in mind one or more clear conditions that tell him to close out his trade and take whatever profits there are. Many successful traders have learned that it is easier to make money than it is to keep it, and the trader who ignores the necessity for a plan on where to realize profits ultimately learns the painful truth to the saying that "trees do not grow to the sky."

The problem caused by trades that do virtually nothing after they are entered is not too serious. If it happens often, the trader may find that she is trading the wrong futures or responding to the wrong events. For the occasional trade that "goes dead" there are two possible solutions. Either an arbitrary time limit can be placed on the trade (so that it can be closed out if little net change has occurred at the end of this allotted time), or it can be held until the delivery month approaches. The method of trade selection will determine which concept is followed.

The trader with well-conceived exit plans not only has completed a large part of her total trading plan but will find that in the heat of actual trading she now has important peace of mind. Knowing exactly where to exit a trade and why is the best medicine for maintaining calm nerves in the futures trading game. The alternative to such planning probably causes traders to make their greatest mistake, namely, "watching the market" and making decisions on the basis of impulsive reactions to random price moves or margin calls. Watching the market does not alter the basic price directions that are possible once a position has been entered, that is, up, down, and sideways. The dangers of watching a market include the often overwhelming temptation to cut profits quickly, ride losses, or overstay positions going nowhere. All tend to tie up capital, waste energy, and confuse and demoralize the trader.

KEY ELEMENTS OF THE PLAN

Capital

Basically, any plan worthy of the name contains certain key elements. One of the first decisions to be made by any speculator who has decided to trade futures is the amount of capital that he is willing to devote to this trading. The extremes that limit this decision are clearly definable. The minimum is the margin on the books of the broker offering the most liberal terms. The maximum is the net worth of the trader plus all he can borrow. In practical terms, neither of these extremes would be considered by a reasonable person, although there is little doubt that both routes have been followed more than once.

The actual amount of the trader's net worth to be utilized for trading depends on many considerations. These were discussed at length in Chapter 5, but some should be noted here because they influence construction of the trading plan. One is the motivation of the trader. If trading is to be only a stimulating avocation, it might serve its purpose just as well if done on a small scale. Another consideration is the personal aggressiveness of the trader expressed by his desire to make money in relation to his willingness to risk losing what he already has. Some traders might be willing to risk a substantial proportion of their net worth in an effort to increase the total by an important amount. Others might be willing to risk only a comparatively small amount of capital because of fear of loss, the difficulty of replacing what might be lost, or personal responsibilities. These considerations in turn may be based on the age of the trader, the effort that was expended to accumulate the capital that must be risked, the size of his family, his health, the type of job he holds, the attitude of his family toward his trading, and his nerve. Basically, a trader should not take a risk disproportionate to the importance to himself of the potential profit. Traders vary in their reactions to different types of trades, which helps explain why one trader will enter a trade rejected by others and reject others that somebody else may find appealing. Sooner or later each trader should become familiar with his own trading curve and select trades partly in accordance with it.

In formulating a plan, a trader is faced with the major question of the types of technical and/or fundamental data on which to base her trade selections. Before she embarks on the all-important trade-selection process, however, she should probably consider the related problems of learning where the data are to be found and how to obtain them regularly with the expenditure of reasonable time, effort, and cost. This is particularly important for the fundamental analyst, because data of this nature tend to vary significantly with the source.

If a trader must study data to make intelligent decisions, she must have a place to do her studying and the time in which to do it. Part-time trading is difficult, and haphazard preparation under adverse conditions makes satisfactory results highly unlikely. The trader must know what types of orders she prefers, preferably for carefully considered reasons, and how to communicate her instructions to her broker without missing markets. These last items may seem mechanical and routine, but they may prove more difficult to resolve satisfactorily than they first appear, and they *must* be resolved satisfactorily.

Trade Selection and Evaluation

No rational person would undertake trading in futures unless he felt that he possessed some method of selecting profitable trades. Recommending any single trade-selection method is not the province of this book. In-depth surveys have been presented of technical and fundamental trading methods so that the reader will be aware of many lines of inquiry. These possibilities may be expanded for all active futures. The purpose of this discussion is to illuminate some of the vital factors that must be considered when a trader chooses a particular method of trade selection and to present some general guidelines on how the method chosen may be evaluated.

Choosing a Trade-Selection Method Would-be traders are bombarded constantly with advertisements and claims. They are informed of methods by private advisory services, brokerage houses, and acquaintances. Few of these methods are worth serious study, and some can produce dangerous errors in thinking. Because most methods are alleged to be wildly profitable, choosing a method by the sole criterion of its having produced the largest past profits is probably an exercise in futility. Instead, careful consideration should be given to other important characteristics that should mark any method of trade selection.

At some point the trader must make a general determination of the factors that will cause him to enter into a market position. He may follow the guidance of some other person or a service, or he may gather sufficient fundamental and technical data of his own to justify a position. Some traders engage primarily in technical research. Others rely on basic fundamental research and seek out situations they believe to be undervalued or overvalued. Still others rely on their own feelings, which may be designated as a "judgment," "the touch," "a hunch," or "intuition" depending on how much dignity one wishes to lend to this often fatal approach. The trader's attitudes preceding the trade entry will help determine the strategy; that is, whether he will lean toward short-term trades or positions held for extended periods, prefer the long or short side of the market, or search out net positions, spreads, or options. If he considers being against the speculative crowd as of great importance, he might often have to prefer the short side. If small margins and the elimination of drastic adverse moves are sought, some spread positions may be preferred.

A popular opinion holds that "fundamentals will give the main direction of prices, and technical factors will provide the timing." Although it is true that most fundamental methods are concerned with long-term factors, one has only to consult a futures calendar to realize that daily fundamental factors affect a number of futures, and there is no logical base for assuming that short-term methods of trade selection based on such information could not be devised. Moreover, a valid technical method can easily be long-term-oriented as well as short-term-oriented. The authors cannot conceive of a technical method that indicates when to take action but gives no clue to the anticipated direction of price. The trader should realize that fundamental and technical methods are often independent means of analyzing markets and as such are not necessarily complementary or contradictory.

Apart from the basic approach, other factors may be considered. Does the trader wish to follow a well-publicized method or a more obscure method which has been purchased or is based on the trader's own research? Advantages and disadvantages may be noted for both approaches. In the first instance the trader may feel that one or more popular methods of trade selection embody valuable truths and that discipline is the one missing element needed to trade them profitably. An analogy has been made that there are hundreds of thousands of pianos in the United States but only a handful of virtuosos. A disadvantage in trading many popular methods, however, is that large numbers of traders may act on such signals. This may result in poor executions because signals from these methods may be efficiently discounted. Even worse, such methods have often caught the public fancy because they rely on axioms of market behavior that appear to be logical but have no basis in fact. They are testimony to a saying often attributed to Jesse Livermore: "With ease, human beings believe what it pleases them to believe."

Perhaps scores of obscure trading methods, some mechanically complicated, are privately printed and sold to limited numbers of people for prices ranging from $10 to several thousand. An advantage to procuring one of these methods may be that the approach to markets may be viable, but the seller may not have the discipline or the desire to trade himself. If this is the case, the quality of the seller's research is not necessarily low. Another reason for buying a method may be that the method of trade selection is sound but the trading plan incomplete, with no allowance made, for example, for money management considerations. In this case both the inventor and the clients may have experienced losses because of poor planning and not because trade selection was inherently poor. Since the importance of a complete plan is usually overlooked, the chances are that any valid private method of trade selection that the trader locates will become available to him because of this reason. The disadvantages of securing private methods are clear and are probably applicable most of the time. That these methods are available calls into question their efficacy. Assuming that their originators are economically motivated, if the trading methods were successful, there would be little need to broadcast their availability to others.

It is possible that the trader may conclude that most, if not all, methods of trade selection available to her are of little use and may wish to do research of her own. If this is the case, she must overcome the almost insuperable obstacle of fooling herself. To avoid self-deceit the trader should vow to be as conservative as possible in validating her method and even then to add an extra margin for error. Results in the real world are seldom as good as they look on paper, using hindsight. Worse than this, frequently some overlooked problem in the method of trade selection is apparent only after the trader's capital has been lost. The number of handwritten worksheets and computer printouts detailing methods of trade selection, all with "excellent" results, must approach infinity.

The frequency of trades should be considered. Some traders may feel comfortable trading every day, whereas others may prefer only a handful of trades every year. Two factors will have an influence on how many trades are made over any time span. The first is the number of markets followed. If a trader follows many futures, he will trade more actively over a significant period of time. The second factor is whether the method used is designed to select trades for long-term or short-term price changes. As a general rule a long-term method will select fewer trades than a short-term method.

Whatever method of trade selection is chosen, the trader must have enough confidence in it and be comfortable enough with it to build it into her trading plan. Once a method of trade selection has been integrated into the total plan, it should not be changed or substituted while trades are being contemplated or made. If, after unhurried consideration, a better method of trade selection appears or an improvement on the existing method seems feasible, the entire trading plan should be redrawn, with the new method of trade selection inserted.

Because of the time factor, the trader may feel that he prefers to use the trade-selection method of a broker, an advisory service, or some other organization. If so, he has saved himself considerable work in this area, but a crucial problem remains. Whether a trade-selection procedure is based on his own or someone else's work, it *must* be validated by the trader himself.

Evaluating a Trade-Selection Method Trading futures with a trade-selection method that has not been validated makes a mockery of the rest of the trading plan. There are few methods of trade selection available to the trader that will not bear the claim that they have been exhaustively validated. The trader is best advised to ignore such claims and validate the method himself. If he does so, two important advantages will accrue. First, he will have certain knowledge of how the method has performed to date without having to rely on the claims of others who are more likely to have a vested interest in displaying impressive results. Second, validating a method of trade selection makes the trader more aware of its properties in a way that cannot be duplicated. This information can lead to valuable peace of mind during the periods of adversity inevitably encountered by even the most successful traders.

A number of considerations must distinguish all worthwhile trade-selection methods or the generation of "buy" and "sell" signals. These are as follows:

1. The method must rest on a solid, logical theory. It is useless to adhere rigidly to a trading strategy that makes no coherent sense.

2. The method must have a back record with the following properties: (*a*) The back record must be in real time, not hypothetical time. If a trader is employing a signaling method and "tests" the signals over some period *in the past,* such a test is in hypothetical time. If a trader compiles a record of signals *before the fact,* the test is in real time. Although considerable back testing must be done, a significant portion of the back record must be in real time. Almost any perseverant person can invent a system that will produce vast hypothetical profits over any past period. Few methods will work under real-time conditions when interpretative principles cannot be modified by hindsight. (*b*) The real-time record of signals must include many different types of markets. Some methods work quite well when prices are in a relatively narrow trading range; others succeed in dynamic trending markets. Still other methods are most profitable when price action is somewhere between these two extremes. It may require a considerable amount of time to produce a data sample that is extensive enough for purposes of evaluation. If the trader is too impatient to obtain a data sample or is falsely persuaded by others that his requirements are not reasonable, he runs a serious risk of evaluating the method by using what is known as "biased sample." This approach would be equivalent to a poll taker determining national attitudes toward taxation by polling only those people who work on Wall Street.

3. The signals themselves must have the following properties: (*a*) The entry and exit prices at which the method suggests action should be realistic. Wheat, for example, might give a buy signal at $3.40, calculated on Tuesday night. If it opens on Wednesday at $3.45 and then rises from there, the entry price must be considered as $3.45 or the trade must be abandoned. It is surprising how many back signal records use the closing price of the signal day rather than a realistic price on the day the trader would act. The same point can be made about exit prices. If the method suggested a stop-loss price of 68.50 cents a pound on a short pork bellies trade and the price rallied 100 points in the last minute of trading to close at 69.00, the exit price should be figured at 69.00. Not only must the most conservative entry and exit prices be used in compiling the record of any method, but it is sound practice to make an extra allowance for "execution costs" in compiling a back record. Adding an extra commission on each trade is one possible procedure. Almost all professional traders will insist that they have never seen a method that made adequate allowance for execution costs. (*b*) Results should be consistent; a number of methods will fail badly when tested in this way. The question the trader should ask is, "To what extent does *each* profitable trade support the overall result?" A method that "would have" transformed $10,000 into $20,000 over a span of 100 trades is not deserving of confidence if the entire gain was achieved by five spectacular winning trades plus 48 nominal losses. A method that made less cumulative profit but had its gains evenly distributed among the successful signals might be much more deserving of confidence. (*c*) The signals must be validated by using sound statistical principles. It can then be determined how worthwhile any signaling method is likely to be and what the probability is that observed results could have been duplicated by chance alone. Chapter 11, "Money Management," covers this important point in more detail.

A hypothetical method with a logical theory behind it embracing a 3-year back record that includes 20 active futures with 600 real-time signals, of which 450 were profitable, would not require much thought to suggest that it might be worth testing for some months. Careful, realistic research on the trader's part might greatly simplify this evaluative step. Nevertheless, it should be done. Jumping to a false conclusion about the validity of a method from a sample of observed trades that is too small or misinterpreted is probably one of the most common errors of the investing public.

4. The method must provide for a realistic way to exit every trade other than exhausting one's capital and being sold out by one's broker. If the trading method utilized permits predetermination of the exit point, stop-loss orders should almost certainly be used. Such stops should not be placed at obvious points suggested by books that explain how to get rich in the futures markets. But stops should be used by most traders. Without them, the question all too often is not *whether* the trader will lose all of his trading capital but only *when.*

Number of Markets to Follow

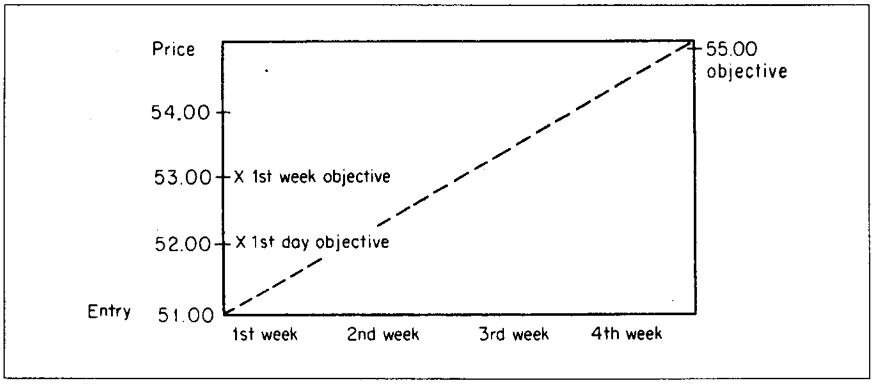
An important element of the game plan mentioned briefly to date has to do with the number of futures to be followed and, of that number, how many to trade actively at a given time. The trader who speculates only as an avocation and who relies on detailed analysis of fundamental information or elaborate technical analysis may find it difficult to follow all active futures without making significant errors. The margin of difference between success and failure in futures speculation is narrow enough without having to deal with opportunities that were inadvertently overlooked or losses that were taken on trades that should not have been entered in the first place. Concentrating on only a few markets permits the accumulation of a larger amount of valuable fundamental knowledge and gives a better feel for the technical action of a particular market. The limitation of such concentration is that many markets may present opportunities for a time, but then trade within narrow limits for extended periods while new or previously inactive markets become active. A willingness to trade in any market that becomes active provides an adequate number of opportunities, but it is possible to be tempted into too many positions or to know too little about a situation to justify taking the necessary risks. Because concentration in selected areas provides fewer opportunities, there may be a tendency to compensate by plunging heavily into riskier positions that will result in large profits if right and large losses if wrong. There is no question of the logic of diversification. A trader following a large number of markets will have more opportunities to profit, because there is a greater chance that one of the markets followed will experience a large trend. Positions in several non-correlated markets over time have been shown to result in higher returns with smaller overall risk retracements.

Time Horizon

The expected life span of a trade deserves some thought. The overall objective is to realize the greatest possible return on the capital commensurate with risk which has been made available for trading. As in any other risk venture, "return" is a function of the time required, not just the number of dollars returned. A small profit attained in 2 or 3 days may justify the time expended and the capital risked, whereas a small profit that takes months to realize may be worth little, even if the chance of attaining it is quite high because of the unavailability of the capital tied up in margin while the trade is open. The trader who makes a quick paper interim profit on the way to what may be a significantly greater objective must give con-

EXHIBIT 9–1

Alternative Price Objectives.



siderable thought to her wisest course of action. Exhibit 9-1 may help to clarify this problem.

If a trader has bought pork bellies for a 4-cent (400-point) gain over a 1-month period, she may be willing to accept a 100-point profit the first day or a 200-point profit during the remainder of the first week. Any point significantly over the line connecting the entry price with the price objective may be considered attractive at any time. Some traders may even wish to enter orders each day to liquidate their positions at a point significantly over the line but within a reasonable day's range. Any order taken alone is unlikely to be filled, but over a lifetime of trading a large number will be.

Considering such alternative price objectives allows the trader to avoid the problem of casting aside a well-conceived plan to take a small profit impulsively, which may be as sure a road to ultimate ruin as any. Most traders willing to seize the opportunity to realize a quick small profit are much less willing to liquidate a position when faced with a quick small loss. Replacing possible large profits with small ones but leaving large losses because stop-loss points are considered inflexible produces a series of small profits and large losses, and this requires a ratio of gains to losses far too favorable for most traders to achieve.

Adding to Positions

The simplest type of plan might provide only for entering a position and liquidating it, but some traders prefer something more elaborate. A trader might intend, for example, to add to an initial position after the price has moved in a direction favorable to him. He is averaging *with the market.* Having bought a contract of sugar at 9.25 cents a pound, he could average by buying an additional contract at 9.65 cents, or, having sold short a contract of copper at 71.50 cents a pound, he could average by selling another at 68.50 cents. The logic of this procedure is that the new price level offers the opportunity to increase the potential profit, while the open profit already achieved allows the possible loss on the expanded position to be little or no greater than it was on the original position. It might even be less if the paper profit was large enough when the new units were added. The sugar trader was willing to risk 40 points from the current price, and so when he bought his first contract of sugar at 9.25 cents, his 40-point risk would have come out of his working capital if the market had gone against him. When he added his second unit at 9.65, the market continued to rise, but if it had reacted 40 points and he got out, he would have lost 40 points on the second unit but nothing on the first except his paper profit. It he had added a third unit, or line, at 10.05 cents, he would no longer have lost any of his capital on a 40-point reaction because he already had a 120-point open profit to act as a buffer. The disadvantage of trading in this manner is that each new unit offers less potential and more risk than those previously added because the market is closer to its ultimate objective by the amount of the price change that has already taken place. The result of poorly timed additions might well be the loss of profits already achieved in order to try to gain even larger profits. The trader who regards equity as the ultimate measure of her financial strength does not consider the loss of paper profit different from the loss of any other kind of capital, and this might well be the most logical attitude.

Averaging *against the market,* the alternative to averaging with it, provides for the addition of new lines after the initial position shows a loss. Use of this averaging technique against the market assures the trader of making more money than the trader who averages with the market when he proves to be right in his selection of a position and his timing. It also means that his worst positions will be his largest because so much adversity has provided him with the "opportunity" to add so much. His best positions will be his smallest because they provide no opportunity to add to the original line. Eventually the averager against the market is likely to find himself in a position that deteriorates so far that he can no longer support it, much less add to it. It has been said that sooner or later all that an averager will have left is averages. One cynic has called it the "anchor method."

Both types of averagers face the problem of how many units to add to their initial positions and when to add them. Adding a number of units at the new levels greater than the number originally established is a technique too aggressive for most traders to accept. The trader, for example, who buys one contract of cotton, adds two more on strength and then three more on still more strength, and continues to add in this way, eventually risks buying such a large number of units near the top of a price move that even a relatively slight reversal quickly eliminates all the paper profit that was gained on the smaller number of units acquired at lower price levels.

Stops

The trader should estimate the amount of loss that might have to be suffered in the event that a trade proves unsuccessful. This amount may be determined from a price level indicated by chart analysis or a percentage of some dollar figure deemed to provide a valid guide, such as a percentage of the margin or of the current price level of the future. It may also be nothing more elaborate than the monetary loss the trader is willing to take before abandoning the trade. The potential profit may then be compared with the potential loss. Many traders erroneously believe that the potential profit must be at least twice the potential loss before a position is justified, whereas others correctly are willing to vary the ratio according to what they regard as the *probability* of achieving the profit. They may feel, for example, that a potential profit of a given amount is worth seeking even at the risk of a loss of an equal or even greater amount if the chance of achieving the gain is materially greater than that of suffering the loss. The opportunity for even a small profit can be quite attractive if the risk of losing a small amount is minimal. This concept is discussed in detail in Chapter 11. Regardless of the favorableness of the ratio of expected profit to expected loss, some trades must be passed just because the dollar amount of loss that must be risked is too great for the trader's capital to bear. Erosion of his capital by the attrition of one bad (or unlucky) trade after another is a hazard that no trader can eliminate, but to risk consistently so much of his capital in trades that "can't miss" that recovery is not reasonably likely is a certain road to ruin. For some perverse reason the trades that cannot miss are always the ones that seem to.

There is some difference of opinion concerning the relative wisdom of actually placing orders to liquidate a position at predetermined points and liquidating when the market touches one of them. Generally it is difficult to justify failure to enter an order when the objectives and stop points have been determined. Actually entering the orders assures that a carefully prepared plan will not be replaced by impulse during the heat of a trading session. A satisfactory profit that was expected, achieved, and then lost in the effort to try for more can be completely demoralizing. A reasonably small planned loss that is replaced by an unreasonably large unplanned loss can be more than demoralizing; it can be ruinous. To spend an important amount of time watching short-term ripples in a market in order to avoid entering orders in advance is usually a useless expenditure of time and energy.

Some traders are reluctant to enter stop-loss orders because of some vague feeling that somebody will force the price toward their stop price until their position is lost, after which the market will promptly go the other way. As often as not, this is an excuse to avoid putting in the stop.

A trader who decides not to use stops should at least consider their use carefully before rejecting them. If the market does not move to the stop point, no harm has been done. If the stop is elected and the price moves well beyond that point, the trader may have been saved from complete disaster. If the price moves just a little beyond the stop point, the trader often has time to reconsider without the bias of having to defend a position she is presently holding. If she wants to reinstate, she may do so, and the only cost to her is the added commission, which the market may have saved for her anyhow by going far enough past her stop.[1] The only really painful course that the market could take would be to elect the stop and reverse almost immediately. If this happens to a trader often, he is probably placing stops at rather obvious points, such as just below recent lows or above recent highs. Moving markets have a tendency to reverse temporarily and clean out stops before continuing their moves, and traders should take this into consideration before using stops. Difficulties in this area result not from the use of stops but from their improper use.

Although few novice traders are sufficiently well disciplined to be able to dispose quickly of a position showing a loss, the ability to admit a mistake is prevalent among larger speculators. In his book *The New Market Wizards,* Jack Schwager notes that most successful commodity traders adhere to a rigid stop-loss plan:

> Almost every [successful trader] I interviewed felt that money management was even more important than the trading method. Many potentially successful systems or trading approaches have led to disaster because the trader applying the strategy lacked a method of controlling risk.[2]

THE PLAN IN ACTION

Form of the Plan

Plans may be mental or written, but written plans are preferable for most traders because they are more likely to be complete and to be followed conscientiously. Each trader may develop a plan form of his own to complement his own style of trading. Exhibit 9-2, although not exhaustive, probably contains most of the elements that most traders will wish to con-

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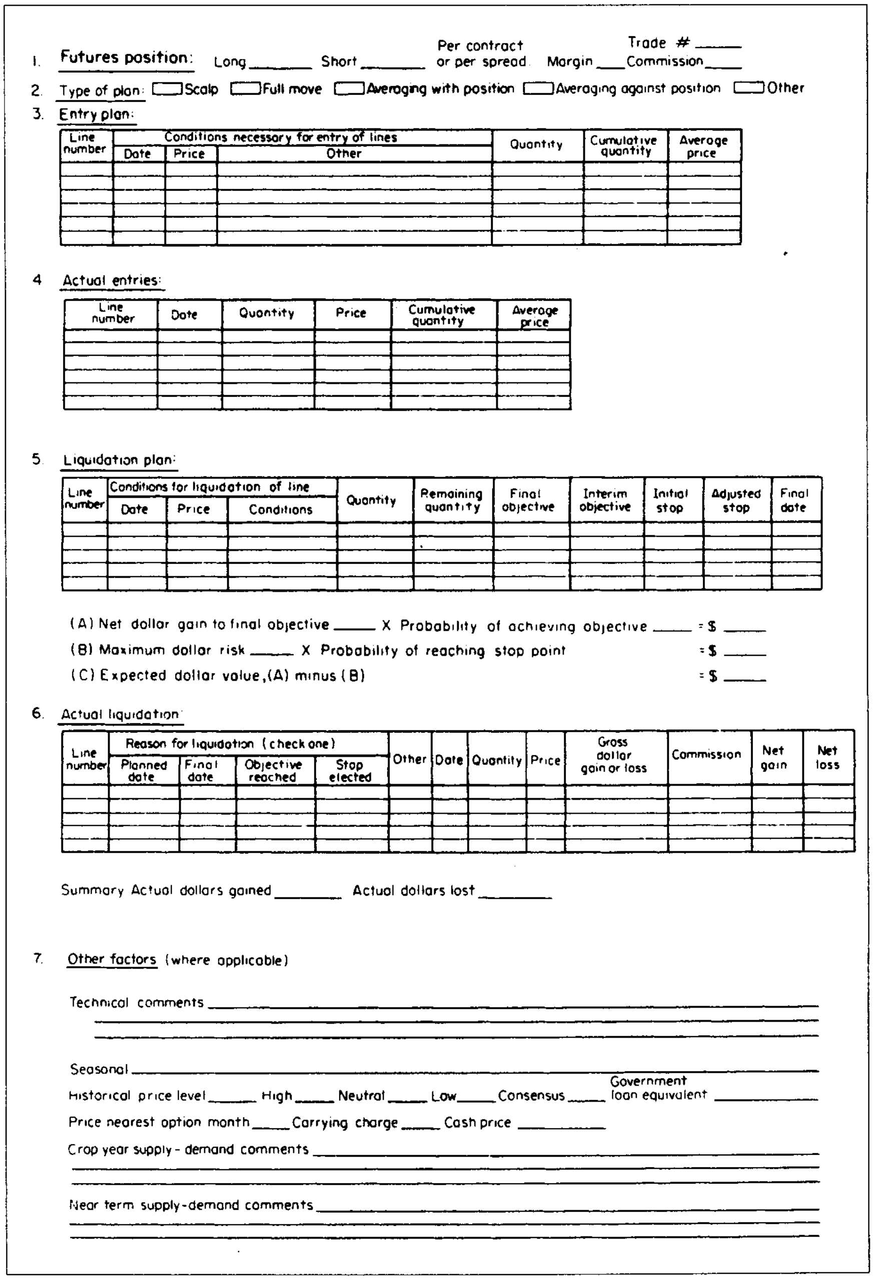
[1] Some exchanges grant reduced commissions for day trades, which make the total cost of liquidating and then reinstating a position quite minor.

[2] Jack D. Schwager, *The New Market Wizards* (New York: Harper Business, 1992), p. 465.

EXHIBIT 9–2

Trading Plan Summary.



1. **Futures position:** Long _______ Short _______ Per contract or per spread Margin ____ Commission ____ Trade # _____

2. Type of plan: ☐ Scalp ☐ Full move ☐ Averaging with position ☐ Averaging against position ☐ Other

3. Entry plan:

Line number	Conditions necessary for entry of lines			Quantity	Cumulative quantity	Average price
	Date	Price	Other			

4. Actual entries:

Line number	Date	Quantity	Price	Cumulative quantity	Average price

5. Liquidation plan:

Line number	Conditions for liquidation of line			Quantity	Remaining quantity	Final objective	Interim objective	Initial stop	Adjusted stop	Final date
	Date	Price	Conditions							

(A) Net dollar gain to final objective _____ X Probability of achieving objective _____ = $ _____

(B) Maximum dollar risk _____ X Probability of reaching stop point = $ _____

(C) Expected dollar value, (A) minus (B) = $ _____

6. Actual liquidation:

Line number	Reason for liquidation (check one)				Other	Date	Quantity	Price	Gross dollar gain or loss	Commission	Net gain	Net loss
	Planned date	Final date	Objective reached	Stop elected								

Summary Actual dollars gained ________ Actual dollars lost ________

7. Other factors (where applicable)

Technical comments ____

Seasonal ____

Historical price level _____ High _____ Neutral _____ Low _____ Consensus _____ Government loan equivalent __________

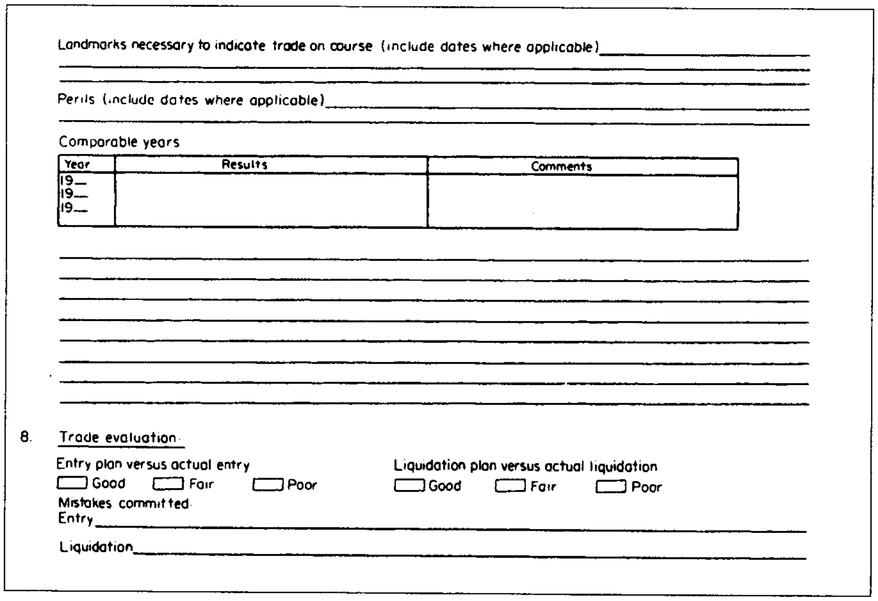
Price nearest option month _____ Carrying charge _____ Cash price __________

Crop year supply - demand comments ______________________________

Near term supply-demand comments ______________________________

EXHIBIT 9-2

Trading Plan Summary. *(Continued)*



Landmarks necessary to indicate trade on course (include dates where applicable)________________

Perils (include dates where applicable)________________

Comparable years

Year	Results	Comments
19__ 19__ 19__		

8. Trade evaluation

Entry plan versus actual entry

☐ Good ☐ Fair ☐ Poor

Liquidation plan versus actual liquidation

☐ Good ☐ Fair ☐ Poor

Mistakes committed

Entry________________

Liquidation________________

sider for each position entered, but it is best for the trader to devise the form that he finds most useful. Some may wish to add or delete items or leave more or less room than is provided in the illustration for specific items. Errors are more likely to result from a plan that is too sparse than from one that is too elaborate. The time and energy spent in thinking through a plan are doubtless worth the money saved through trading haphazardly. A brief explanation of the purpose and use of most of the items in the plan exhibited follows.

The first item, "futures position," can be completed by indicating the future chosen and the contract month after either "long" or "short." If a spread position is to be entered, both blanks could be filled in or a third blank marked "spread" could be added. If a trader keeps her plan forms filed together, she will be kept aware of her overall position. Considering each trade on its own merits may result in the trader's having a number of positions all long or all short. Certain events, such as war or currency devaluation, may cause many seemingly unrelated futures to move sharply in the same direction and leave the trader with a greater loss than she was prepared to take. This should be considered when adding new positions.

The margin for any new position, whether long, short, or spread, should be considered before a trade is entered, not after. Margins can be changed by exchanges or individual brokers and sometimes by considerable amounts. If the trader had expected to be called for an amount materially smaller than is actually required, she may find herself faced with an unexpected shortage of margin immediately after a trade is entered.

The commission per contract must be considered in order to make certain that the possible profit compared with the possible loss is adequate to justify the trade. The trader who decides to scalp 25 points in cattle only to realize that this would represent a $100 gross profit, which must be reduced by a commission of perhaps $20, finds that he is trading for the benefit of a cattle broker rather than for himself.

The "type of plan" may depend on the nature of the opportunity or the personality of the trader. Some people prefer to trade in one consistent manner, whereas others believe themselves flexible enough to trade in different ways at different times or at the same time in different trades. If additional lines are not to be added to the initial position, a quick profit, or scalp, may be expected, or perhaps a major change in price level over a relatively long period would be possible, in which case the trader may hold his position for a full move. If additional lines are to be added, they may be made when the market has moved favorably for or against the trader. In either case he must determine what factors, if any, will cause him to add a second line, a third line, or more lines. Additions may be made at fixed intervals, as predetermined price levels are reached, or on the basis of some other factor that seems important to the trader, such as a reaction after a rise in price. Adding new lines by utilizing paper profits is called "pyramiding."

The "actual entries" may differ from the "entry plans" because of the manner in which orders are filled; for example, a trader may have planned to enter a position in platinum on the opening of the market at a price of about $439 an ounce only to be surprised by an opening of $445 because of some unexpected news. If differences between the planned entries and actual entries are so great and so material that they affect trading results to any great degree, a change in the method used to enter trades is indicated.

The "liquidation plan" is the heart of any plan form. In providing for an exit from a trade that covers any eventuality, the trader avoids the demoralizing experience of riding losses or taking profits impulsively. It is also important that such a plan forces a trader to think through the expected dollar value of a trade before he enters, not afterward. The "expected value" concept is covered in detail in Chapters 5 and 11, but the computational aspects are not difficult and may be introduced at this time.

Assume that a trader believes that she has isolated, quantified, and validated a nonrandom technical device that results in profits in 65 percent of the indicated trades over a reasonable period of time. Further assume that the technical device has signaled a particular trade that, if successful, should result in a net profit of $780, whereas the execution of a stop would mean a $600 loss. Multiplying the profit ($780) by the probability (.65) of achieving the profit gives $507. Similarly, if the dollar risk on the trade ($600) is multiplied by the probability (.35) of losing, the result is $210. The expected dollar value of the trade, $297, is computed by subtracting $210 from $507. Obviously the expected value of a trade should be positive or the trade should be rejected.

The summary following the section "actual liquidation" refers to the *actual* dollars gained or lost on the trade. The trader should check his record of closed profits and losses frequently to ensure that results generally parallel expectations, both in the number of profits and losses and in the average dollar amount of profits and losses.

The section on "other factors" can be adapted by each trader to summarize the factors he considers important. "Technical comments" may include chart formations, volume, open interest, or response to news.

The "seasonal" item is noted because some traders think that many futures have seasonal trends. There is nothing wrong with sometimes attempting to take advantage of a contraseasonal move, but the trader should at least be aware that he is doing it.[3]

Noting the "historical price level" makes it certain that the trader knows whether he is trading at prices that have been proved unusually high or low in the past. This might not dissuade him from buying at historically high prices or selling at historically low prices, but it guarantees that he is doing it knowingly rather than inadvertently.

The "consensus," particularly of brokers and services that influence a number of traders, helps to determine whether a contemplated position is with or against the crowd. This factor, again, may not be considered critical, but it does help one to avoid being the last to buy or sell.

The "government loan equivalent" or other government price influences (where they apply) should be considered with the historical price level to help determine whether the current price of a future is too high or too low. If the price seems historically high, for example, but the loan level

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[3] Seasonal movements, like most of the other apparent consistencies in the futures markets, have a natural tendency to disappear or become distorted when they become well known. If a trader believes that she has discovered a consistency, she would do well to keep it to herself.

has been increased drastically, the market price may appear to be not nearly high enough rather than too high.

The relation of the cash price to the near-term contract often is a clear indicator of near-term strength or weakness. A change in the relationship may provide an early indication of a change in price direction of the futures market.

"Landmarks" point out events that can reasonably be expected to happen if the trade is to be considered on course; for example, the results of a government report which is scheduled to be released on a given date should generally be in line with expectations of what the report will indicate.

"Perils" are closely related to landmarks because a report that contains statistics unfavorable to the trader's position may prove to be a peril instead of a landmark. Some perils, of course, such as a freeze in Florida when a trader is short on orange juice or a large unexpected release from the government stockpile of copper when the trader is long on copper futures, cannot be definitely dated.

The "comparable years" section simply indicates past years in which conditions were similar to those in the current year. If the direction of price or timing in those years is not consistent with the trader's intended position, she should have some reason to believe that there are conditions existing in the present year that are different enough from conditions in the past to justify her position. Because the list of "other factors" may be wide and deep, additional space should be provided for their notation.

The "trade evaluation" section of the plan is a control of the trader's discipline. Sooner or later price movement must have elected a stop or an objective or time must have run out. In any case, the result of most trades should be in accordance with the objectives and risks covered in the plan. The trader should eventually have a plan form that is detailed enough and a discipline that is strong enough so that there is seldom a significant variation within his control between the possible results, good or bad, and the actual results.

A Specific Plan

A plan is so basic to successful trading that it is worth pausing to explore in depth some of the thought that goes into its construction. Assume that a speculator has decided to enter the futures markets and will risk $10,000 for this purpose. He has selected a brokerage house and a registered representative, opened an account, and deposited his money. He has also decided to limit his trading to wheat until he becomes knowledgeable enough to enter other markets.

It is October, the recently harvested wheat crop was a large one, and current prices are low. The trader has decided that the current price level adequately reflects the size of the crop and that there is no logical reason for it to go much lower. He also concludes that potential foreign and domestic demand, as well as anticipated commercial hedge lifting, should result in a price rise. The chart he keeps also indicates that the decline in price has stopped, and he interprets this as a signal that bullish forces are about to become dominant and that a rise is probable. He therefore decides to enter a long wheat position.

Having decided to buy wheat, the trader must make a rational choice among the various markets where wheat is traded. This decision will be based on the estimated location and time of the greatest demand for wheat and on the type of wheat that will be in the shortest supply. If the trader decides that the anticipated demand will be reflected in Soft Red more than in Hard Red and in winter more than in spring wheat, he will probably take his position on the Chicago Board of Trade rather than on the Kansas City or Minneapolis exchange. He will then have to determine which contract will best reflect the expected tightness. He can do this either by making a fundamental judgment or by looking at wheat charts from other years with similar fundamentals and noting what happened then. He may also consult charts of other commodities in an effort to find similar patterns. It appears to the trader that the December contract does not provide him with enough time before having to risk taking delivery; but believing that a rising market will cause inversion, he prefers nearby contracts to those more distant. He therefore compromises by selecting the March contract. He notes that in recent years during which wheat prices have risen, March gains on May, and May gains on July. Therefore, a spread position in which March is bought against a short position in July might be profitable. Because the trader has adequate capital available for margin and because he believes that the risk of a net long position is reasonable, he decides merely to buy the March wheat, which is selling at \$3.54½ a bushel.

Analysis of the recent market, as well as analysis of those in years with similar characteristics, indicates that a gross profit of 30 cents a bushel has a .55 probability of being achieved by December 15, whereas a decline to \$3.39½ a bushel would indicate that the market is not "acting right" and that the trade should be abandoned. The probability of the latter is judged to be .45. If the price were to rise by 30 cents, the gross profit on a contract of 5000 bushels would be $1500, which would leave a net profit of $1440 after deduction of the $60 round-turn commission currently charged by the trader's broker. If the trade had to be closed out unfavorably at $3.39½, the decline of 15 cents a bushel would represent a loss of $750 plus the commission, or a total of $810. Considering that the expected value of a profit is $792 ($1440 × .55) and that the possible loss is estimated at only $364.50 ($810 × .45), the trader regards the expected value of the trade of $427.50 ($792 – $364.50) as adequate and decides to enter the trade. He is aware that the chance of having to liquidate a little below his stop point exceeds the chance of having an order filled above his profit objective, but he considers even the worst-case expected value positive enough to justify a position.

Because he thinks that the ratio of profit to loss is small and because so much time may be needed for the position to reach its potential, he decides not to tie up much available capital in this trade. The modest objective and close stop-loss level preclude any additions to the original position on either strength or weakness. The speculator decides that the most he is willing to lose on this trade if it proves to be unsuccessful is 10 percent of his trading capital, or $1000. Note that he is concerned more with the amount of his trading capital that he might lose than with the percentage of his margin or the change in the price of the wheat itself. Accordingly, he buys 5000 bushels of wheat at $3.54½ and immediately enters an open order to sell the 5000 bushels at $3.84½ or at $3.39½ stop O.C.O. (one cancels the other, or order cancels order). A reminder is written on the trading plan to liquidate the position at the close of the market on December 15 if neither the objective nor the stop-loss point has been reached by that time. The amount of thinking and planning represented by a plan even as simple as this probably exceeds that done by many traders, which may be one reason why so many people lose money trading.

A refinement of the plan outlined here is a provision for accepting something less than a 30-cent profit before December 15 in order to consider the time needed to make a profit as well as its amount. As an extreme example, a rise of 20 cents on the same day that the position was taken would leave the trader in the position of possibly waiting for 2 months or more to make 10 more cents at the risk of losing back the 20 cents plus at least the other 15 cents to the stop point. It may appear to be logical to accept the 20 cents because the additional gain is too small to justify the possible loss from the new price level. By the same token, it is never possible to make 30 cents in a position if a profit is always taken at 20 cents. One possible solution is simply to wait for the other 10 cents in accordance with the plan. Another is to have the plan provide for such possibilities by allowing profits to be taken if they are achieved quickly. For example, it may provide for a profit of 16 cents to be taken during the first week, for 19 cents during the next 2 weeks, for 24 cents during the next 2 weeks, and for waiting for the objective of 30 cents thereafter. It is important, however, to work these possibilities into the plan rather than modify the plan haphazardly in accordance with impulses.

COMMODITY POOLS AND MANAGED FUNDS

Most of this book considers investments in futures contracts based upon decisions made by investors themselves or advice given to them by their brokers. Others, however, prefer to turn their funds over to external professional managers. There are three primary ways of using professional management services. There are both public and private pools or funds and individually managed accounts. In addition, advisory newsletters and hotlines provide advice without actually directly controlling customer funds.

The primary reason is probably the perceived expertise of the professional manager. Investors may think that professional managers have access to better information about futures markets or know better how to interpret it. Or the perceived expertise may relate to quantitative ability or computer skill.

There may be other reasons more subtle than perceived expertise. One involves diversification. Investors may believe that the widely accepted benefits of diversifying in securities markets apply as well to futures markets. A pool has sufficient capital to diversify its investments into many futures markets, and this is assumed by many scholars and investors to reduce risk.

Lower transaction costs might attract some investors to pools. The more an investor pays in transaction costs, the less he has to invest in the markets and the sooner he will lose all of his funds if his positions go against him. Even if he is successful, he must overcome the cost of trading before he gains enough to justify his time and risk. Because of their size, some pools may be able to negotiate lower commissions than individual traders. Although this may be true in some cases, even small investors can often negotiate favorable commissions or patronize discount brokers. Furthermore, many pools charge commissions that are even higher than standard retail rates. Funds sponsored by brokerage houses have, of course, an interest in survival, but they also have an interest in generating commission income.

The leveraged nature of futures trading may offer another advantage of pooled trading. Futures contracts are highly leveraged vehicles usually requiring margins of between 0.5 percent and 10 percent of the value of the positions held. This can result in substantial profits if the prices of the positions held move in the investor's favor. As usual, however, the cost of this opportunity is the acquisition of risk that is at least equally as substantial. This means that small market moves against an individual investor can lead to margin calls, exhaust the investor's capital, or even require the deposit of funds beyond the capital the investor had planned to utilize for futures trading.

Many commodity investors have been correct in their assessments of the direction in which markets would move only to find that a small adverse move exhausted their funds and that as a result they were out of the market, although they eventually proved to be correct. There are all too many futures investors who were correct about market direction but not right soon enough and as a result lost their trading capital. They can sympathize with the football coach who never lost a game but admitted that a few games ended too soon.

Professional investors rarely use their maximum leverage. Instead, they usually keep half or more of the total funds they manage in a low-risk investment such as Treasury bills. By being less than fully invested, they can withstand greater adversity and survive to trade another day.

Individual investors could also refrain from investing up to the extent of leverage permitted. They could deposit more than the required margin or put half or more of their funds in money market funds or savings accounts. This might appear to make considerable sense, particularly if a fund is charging fees based upon funds deposited but not utilized. Actually, however, most individual investors do not exhibit such conservative behavior but prefer to work their funds to the maximum. According to fund advocates, professional investment managers have sufficient discipline to limit their market exposure, whereas individual investors do not and therefore are "blown out" of the market on any adverse move.

Most funds do not require individual investors to deposit funds beyond their initial investments and thus offer some of the same appeals as options. Total exposure is known in advance, and investors are able to weather temporary adversity without losing their investments.

Thus, professionally managed funds are thought to be preferable to individually managed funds because of greater expertise, greater and less expensive opportunities for diversification, lower transaction costs, and the opportunity to utilize leverage at a reasonable cost and with a quantifiable total exposure. These advantages must be weighed, however, against the costs of utilizing professional managers.

Structure of a Commodity Pool

A commodity pool or fund is a partnership, usually consisting of one general partner and several limited partners. The general partner is typically the commodity pool operator (CPO)—the person who organizes the pool and bears an unlimited risk of loss. The limited partners invest their funds in the pool. Their risk is limited to the amount of funds invested.

Trading decisions are made by a commodity trading adviser (CTA), who is chosen by the CPO. The adviser is usually compensated by fees and a percentage of any profits achieved. Remaining shares of profits may be distributed to the partners or utilized to increase the scale of trading.

The other participant in a commodity pool is the selling agent or distributor (there may be more than one agent or distributor), who actually sells or distributes the shares of the pool to the investors, or limited partners. Selling agents or distributors are typically brokerage house salespeople. A pool may not begin to invest the funds raised from investors (open) unless a specified minimum level of total capital is achieved. The selling agents may share in the initial costs of setting up a pool, even if it does not ultimately succeed in opening. The structure of a commodity pool is summarized in Figure 9-1.

The selling agent also receives a commission for each share of the pool he sells to the limited partners.

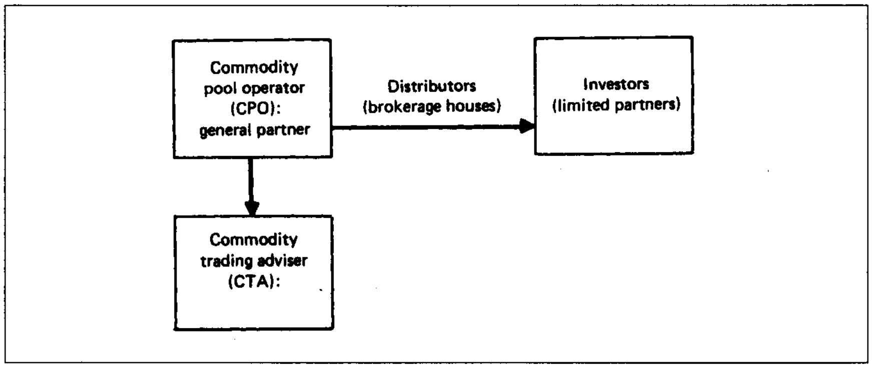
There are many possible variations among the detailed structures of pools and in the distribution of their costs and fees. Such details are available from the prospectuses, or, which should be available to prospective investors.

The Growth of Managed Futures Funds

The rapid proliferation in futures funds began in 1978. The managed futures industry has grown from about $500 million at that time to over $30 billion. The largest class of investors is high-net-worth individuals,

FIGURE 9–1

Structure of a commodity pool.



although institutions and pension plans are becoming increasingly important participants.

A convenient source for following the performance of the major public commodity funds has been the "Funds Review" section of the monthly periodical *Futures* magazine. Monthly tables list between 50 and 100 of the funds and identify their general partners, underwriters, and trading advisers. These tables also indicate changes in the unit values and distributions of the funds since their opening dates.

Public Funds, Private Funds, and Investment Advisory Services

It has been indicated that there are three similar but different ways that investment advisers may be utilized to manage individuals' commodity investments.

The first and most common involves the public commodity fund or pool. The public fund, similar to the stock or mutual fund, is offered to the public by the brokerage houses or other distributors. Since the fund is offered to the public, it can be advertised, and solicitations can be made by brokers for the fund. Because the fund is offered to the public, it must be registered with the Securities and Exchange Commission (SEC), and as part of the registration process, a prospectus must be made available. The fund must also be registered with the states under the blue-sky laws. However, neither the SEC nor the states have any ongoing regulatory authority over a fund.

The public fund must also be registered with the CFTC. In addition, its CPO and CTA must be registered with the CFTC. In this context, the track records of the CTA must be made available. The CFTC also has an ongoing regulatory authority over a fund—this is mainly used to assure disclosure of the performance of the fund. In a public fund, the investment increments are typically small—for example, $5000.

Private funds or pools are again pools of several investors' funds, which are combined and managed together. A private fund, however, cannot be offered to the public; that is, it cannot be advertised, and solicitations to the public cannot be made by brokers. Because of this, it does not have to be registered with the SEC. States also exempt private funds with certain characteristics. The private fund is, however, regulated by the CFTC, which also enforces the same type of disclosure that public funds make.

Whereas public funds are generally marketed to investors, private funds are typically composed of a small group of investors who contribute a larger amount of funds—typical minimum contributions are $20,000 to $25,000. To avoid SEC registration, only "accredited investors" can participate, that is, investors who can "fend for themselves." These accredited investors may be institutional or business investors or individuals with substantial net worth or income. And most states exempt state registration for pools with at most 35 accredited investors.

The third way in which investors can have their funds managed in futures markets by a professional adviser is via an individually managed account. In this way the investors' funds are not mingled with other investors' funds and invested together; instead, their funds are individually managed. In this case, although the manager has to be registered with the CFTC as a CTA, the investment itself does not have to be approved or regulated. A typical minimum amount accepted by professional managers ranges from $25,000 to $1 million.

Individual investors may also manage their own funds, that is, make their own investment decisions, but rely to varying degrees on investment advisory services. These investment advisory services are usually used on a subscription basis and make explicit investment recommendations, usually in periodic publications.

Selecting a Fund

Several factors should be considered before an investment is made in a managed fund. The track record of the adviser is considered by some to be quite important. A record of the past performance of an adviser may be supplied by the adviser herself or by the broker representing the fund.

Heavy reliance upon track records can create problems. It makes it difficult for new, potentially successful advisers to become established. It takes a track record to get funds, and it takes funds to develop a track record. A good track record may result from certain types of markets which may establish misleading short-term results. There may have been changes in personnel who helped create the good record. A good track record may result in the attraction of so much capital that it can no longer be successfully managed.

Some investors rely upon the techniques used by the advisor. Some prefer fundamental analysis and others technical analysis. Many of the latter are impressed by computerized approaches to trading. Other investors consider primarily the reputation of the pool organizer, who is the general partner of the fund.

Initial and continuing fees should be carefully considered. Heavy upfront claims on the initial investment, consisting of organization costs and selling expenses combined with trading costs and profit sharing, may require trading results that cannot reasonably be maintained over time. The investor should determine not only what can be lost if trading is unsuccessful but also what return can be expected if trading is successful. Although the total loss is limited, this provides little satisfaction if such a loss is probable sooner or later or if excellent gross results would provide the investor only with what could be netted in investments with far less risk.

As a minimum, investors should be aware of the reputation of those with whom they are dealing. It is difficult enough for sophisticated traders of high integrity to be successful in futures trading. Investors who choose to invest with fly-by-night boiler-room operators must take some of the blame for the ultimate loss of their capital.

MISTAKES

As in most other activities requiring skill, success or failure in trading futures is largely a matter of how many mistakes are made. Most of them occur in the area of planning, but one of the greatest is not having a plan at all because no plan, no matter how poorly constructed, will allow for the loss of a trader's entire trading capital. A plan should give the trader a chance to try again. The alternative to planning is "watching the market," which usually results in trades being made in response to haphazard impulses triggered by random news items or hunches. It also results in considerable time being wasted watching a tape or a quotation board, time that could be used more productively by doing almost anything else. Boardroom traders too often take a small profit as quickly as possible and then rationalize by saying "You never go broke taking a profit," or they ride a loss and say "I'm locked in."

It should be remembered that the primary advantages of planned trading include the limitation of losses in relation to available capital and a formula for getting out of a trade, regardless of the direction taken by price. If a trader devises a plan that permits him to risk all of his trading capital or does not allow him to get out of a trade unless it goes in only one direction, he had better spend some time thinking about plans before he does much trading. Jay Gould is credited with having said "The perfect speculator, the perfect gambler, if you will, must know *when* to come in; more important, he must know when to stay out; and most important, he must know when to get out once he is in."

Aside from not having a plan at all, the greatest possible mistake probably is to have a plan and not follow it. The temptations to make errors when a plan is not followed may be overwhelming. When the profit objective has been reached, the market has obviously been "acting well," and the trader must beware of "waiting for a while" to see what happens next. If still more profit is made, he can put in a new stop at the level of his original objective and make more money. The danger, however, is a reaction just after the initial objective is reached and before a stop can be inserted at a favorable point. If reasonable profits are attained and then lost back, the chance of success in the long run becomes remote. Even worse is making excuses not to take a loss when the stop point is reached. Every trader is able to rationalize riding losses by convincing himself that recovery is virtually certain from the new level, that if he were not already in the trade he would certainly enter it now, that further adversity is simply impossible, or that it is the wrong day or wrong time of the day to take the loss. The fact remains that the risk level influenced the size of the position being carried, and this in turn influenced the amount of capital being risked, which was the maximum considered reasonable. Any further loss therefore becomes unreasonable by definition. One solution to this problem is to remove temptation by putting in the stop order to liquidate the position immediately after the position is taken and leaving it in regardless of current news, time of the day, or anything else. Unfortunately the alternative to a planned loss is an unplanned loss, and the trader who habitually receipts for unplanned losses is firmly embarked on the road to ruin.

Perhaps the most stultifying mistake that can befall a trader is the assumption that success is virtually certain if he adopts a rational trade-selection strategy and intelligently follows the elements of a successful plan as developed in this chapter. Unfortunately there is a final obstacle to success—money management—which is the proper concern of the closing chapter of this part for those who play the game.

NOTES FROM A TRADER

A most important aspect of planning is to *have* a plan. Another is to follow it. A plan not followed is like an automobile seat belt not buckled. A plan should be kept to oneself. When other people are looking over the trader's shoulder, things start to go wrong, because she begins to attach some importance to their reactions to what she does, when they really should not affect what she does at all.

There is always some apparent reason for trying for still more profit or not taking a loss. If the trader lacks the discipline to set objectives and risk limits and to act when either is reached, he should not trade futures.

The trailing stop seems to be an infallible device for taking advantage of big moves with modest risk. For reasons developed thoroughly in Chapter 4, this device rarely works.

Plans may be difficult to devise and adapt to one's own trading preferences, and even a carefully conceived plan may not work. Markets may act in a way in which they have never acted before, and all the work that went into a plan's preparation may appear to have been wasted. Discouragement from time to time is part of the game, and famines have a way of following feasts. Despite any apparent disadvantages, there can be no doubt that trading with a game plan is far better than trading without one.

10 CHAPTER

Money Management

> "It is remarkable that a science which began with the consideration of games of chance should become the most important object of human knowledge. . . . The most important questions of life are, for the most part, really only problems of probability."
>
> —*Pierre Simon de Laplace*
> Théorie Analytique des Probabilités,
> *1812*

INTRODUCTION

Games of speculation are different from gambling games in both the economic and legal senses, but to the typical speculators the similarities of the two activities greatly exceed the differences. Their reasons for engaging in either one are the same: profit, excitement, diversion, compulsion, or some of their combinations. Most important, many of the rules are quite similar, and therefore the extensive thought applied to gambling games is quite applicable to the futures trading game as well.

Traders, like gamblers, will find it far more difficult to handle their money in a logical and disciplined manner than to learn the rules of the game. Anyone, for example, can learn to play draw poker—the ranking of possible hands and local interpretations of the rules and procedures—in an hour or so. Many people, however, have played the game for years and have lost consistently because of poor money management. Most of these losers bemoan their bad luck, just as losing futures traders tend to blame their brokers, unexpected events, or bad luck for their own errors in money management.

It is impossible to develop a set of rules in this chapter to serve as a guide for all traders under all conditions. Trading is an individual decision-making process, and each trader brings his or her own unique intellectual and behavioral background to bear on the problem of approaching futures trading most profitably. Traders have different goals in the markets, different attitudes toward their profits and losses, and different preferences in their styles of trading, to say nothing of a host of other differences such as time available, tax considerations, and financial and psychological strength. Traders who hope to succeed in the long run must be able to recognize and develop their behavioral skills in order to determine a set of objectives most logical for their concept of maximum advantage. To employ a money management system effectively a trader must consider its four basic elements:

1. Initial capital
2. Objectives
3. The expectation of the game being played
4. The probability of ruin

The first two were discussed in preceding chapters. The remaining two are considered in the pages that follow. The discussion here does not consider subjective motivations in great detail because it would require an extensive foray into psychology involving a wide range of personal drives such as a guilt-ridden risk lover's desire to lose his money.

EXPECTATION OF THE GAME PLAYED

Probability

A game, as discussed here, may consist of one or more trials which a gambler would call bets and a speculator would call trades. The expectation, or average payoff, of the game being played indicates whether it consisted primarily of fair bets (those with zero expectation), good bets (those with a positive expectation), or bad bets (those with a negative expectation). If the game consisted of only one trial, the expectation of the game and the trial would be the same. A basic element of expectation is the long-run relative frequency of an event occurring. This element is probability, expressed as a number ranging from a low of 0 to a high of 1.

An example is provided by a game centering on the flipping of a coin. The probability of "heads" is .5 and the probability of "tails" is .5. Another example is provided by the draw poker player who is holding four spades and draws one card to his hand hoping to find a fifth spade to make a flush and, it is hoped, win the pot. The probability of drawing that fifth spade from a deck of cards without a joker is .191; the probability of not drawing it is .809.

It should be noted that the gambler or player of a social card game has a decided advantage over the speculator in the futures or stock market in that the gambler is able to determine the precise probabilities inherent in the game and to act accordingly. (This is not to say, of course, that the player will actually use that advantage or that knowing the probabilities will enable the player to profit from playing the game.) A roulette player may be interested in betting on red versus black or odd versus even. She can readily determine that the wheel has 36 numbers, half odd, half even, half on a red background, and half on black. In addition, most American roulette wheels have a "0" and "00" on a green background, on both of which the casino wins all red, black, odd, and even bets. The player knows, therefore, that there are 18 chances to win and 20 chances to lose, regardless of how she bets. The probability of winning is .4737 ($^{18}/_{38}$) and the probability of losing is .5268 ($^{20}/_{38}$).

Unlike the coin flipper, who knows that after many flips approximately half will have resulted in heads, the futures trader who concludes that sugar is going to increase in price is far less certain of measuring the probability of this event occurring before an unreasonably large adverse move. He may believe that the chance of an adequate rise in price before a substantial drop is .7, but this probability is subjective. Regardless of the thoroughness of his fundamental or technical research, the futures trader is applying his knowledge of the past to make his evaluation of the future. But in an area as dynamic as the futures markets conditions as well as probabilities change frequently. Even a huge number of samples to serve as a guide cannot lead to certain determination of the probabilities of success or failure because of the complex and fluid nature of the game and the rules under which it must be played.

Payoff

Those who play a game or trade a market normally hope to get more out of it than they put into it. The emphasis here is placed on money payoff rather than psychic costs and income (most people seem to get more satisfaction out of winning than losing, anyway). The money payoff of a game (gambling or trading) can be used to measure what may be won versus what may be lost, modified sometimes by an admission charge to a casino or a commission charged by a broker. A player may be in a position, for example, to win $1000 if she wins or to lose $500 if she loses. In this case her "money odds" may be said to be 2 to 1 of winning.

It should be clear that the mathematical *expectation* of a game depends on the probabilities and payoffs. Specifically, it is the sum of the possible payoffs with each payoff weighted (multiplied) by its respective probability. The player who stands to win $1000 or lose $500 with a probability of winning of .5 has a mathematical expectation, or average payoff, of $1000 × .5 – $500 × .5 = $250 and obviously might consider playing the game because in the long run she will average a $250 gain per play of the game. Suppose, however, that a player stands to win only $500 if he wins or lose $1000 if he loses. He might be tempted to reject the game out of hand, but what if the probability of winning were .9 and the probability of losing only .1? The expectation of the game would be $500 × .9 – $1000 × .1 = $350, still a positive value. On the basis of monetary expectation, the second game is more favorable than the first, for which reason the often-given advice to take a position in the stock or futures markets only if the trader will make two or three times or more what he may lose is ordinarily so foolish. Those giving such advice rarely speak of the *probability* of winning or losing, and without it the expected monetary value of taking the position cannot be determined. A game in which the player may win twice as many dollars as he stands to lose is no different in expectation from a game in which he may lose twice as many dollars as he may win if his probability of winning the first game is .33 and the probability of winning the second game is .67. Expectation, in short, is nothing more than the average payoff, which is derived by modifying the payoff of an event by its probability of occurring.

Depending on the combination of probability and payoff, a game may be said to be favorable if its expectation is more than zero or unfavorable if less. Returning to the roulette player discussed above, it will be recalled that the probability of her winning was .4737 and of losing, .5263. In the usual casino the player will be offered a money return equal to the money that she risks; that is, a player who bets a dollar on red, black, odd, or even will lose the dollar if she loses and win a dollar if she wins. Usually there is no charge for admission to a casino, so the payoff to the player is even (or the odds may be said to be 50-50). The mathematical expectation of the game to the player betting on one of the four items listed would therefore be 47.37 cents of each dollar bet, and the expectation of the casino would be the other 52.63 cents. The house "take" or "advantage" is the difference of 5.26 cents on a one-dollar bet, or 5.26 percent of all bets. The player may be said to be making a bad bet, and because the house has the other side of all players' bets, it may be said to be making all good bets, each by the same margin.

The futures trader who tries to discover whether he is in a better or worse position than the roulette player finds his analysis difficult. He is aware precisely of only one aspect of his expectation of winning, and that is some part of his payoff. He can probably determine the commission that he will have to pay and estimate the opportunity cost on the capital that he utilizes for margin. The remaining element of the payoff, that is, how much he will win or lose because of market action, is far more difficult to determine accurately. A disciplined trader can, of course, determine the points at which he intends to liquidate his position, win or lose. He may even be sufficiently disciplined to enter orders at the two points he has determined—one intended to take his profit at the objective and the other to stop his loss when he has all the adversity he cares to suffer on a trade. If he sets his objective at a definite limit and leaves an open order in at that point, the chance of his getting exactly his price on a *successful* trade is quite high. He obviously cannot get less, and only infrequently will a market act so favorably for him that he will be filled at a price that is better than the one he has asked. On a losing trade, however, the outcome is far less certain. If he enters a stop-loss order which is elected, that order can be filled at his stop price, but also at better or worse. A fill at a better price than the stop specified is even rarer than a fill at a price that is better than a limit on the order at a trader's objective; but a fill at a price that is worse than that specified on a stop-loss order is quite common, and sometimes the fill is *much* worse. On balance, therefore, if the trader wins, his objective will usually be exactly as planned, but if he loses, the loss will frequently be greater than expected. (This is one of the major reasons why trading in the real world seldom turns out to be so profitable as one's paper trading has indicated that it should be.) The sophisticated trader must learn eventually to take this into consideration and plan in advance for the "execution costs" of his trades to include not only commissions but also some extra adversity on his losing trades. He may well have learned that the cost of extra adversity over a long period of trading may approach the far more obvious cost of commissions.

Despite his problems of probability and payoff, the trader must reach a conclusion concerning his chance of being ahead after making one or a series of trades, determine how much he expects to gain if he wins and how much he expects to lose if he loses, and use this knowledge in planning how to play the game. He may, of course, also decide not to play at all after completing an evaluation of his expectation.

Fair Bets

It is obvious that if a game consisted of one or more fair bets, it would involve a zero expectation and be an even game. It might be concluded that participants in such a game must be playing basically for fun and that no one has the right to expect to win in the long run. This, however, is not the case. Although the amount of money a person has does not affect the expectation on a single play of the game (whether the flip of a coin or a trade in plywood), the capital available to the players can be of tremendous importance in determining their eventual financial outcome.

If two players are betting on coin flips and one has significantly more capital than the other, that player's chance of eventually winning all the other's money, hence ruining him, is considerable. The greater the difference in relative capital and the more of his capital the poorer of the two players bets, the greater the probability that the richer will ruin the poorer and the faster it will happen. Even though the coins will work toward 50 percent heads and 50 percent tails, the probability of "runs" of heads or tails also increases as the game progresses. The probability, for example, of a series of 10 heads being flipped consecutively in 10 trials is not great; but if one continues to flip a coin for days at a time, the probability of 10 heads appearing in a row *sooner or later* actually will become rather high. If this event should be favorable to the poorer player, he will increase his capital and the richer player will be somewhat impaired, but if the series favors the richer player, the poorer can well be ruined. The richer player can expect to have his run sooner or later. That is why a gambling casino competing against small players does not even need its favorable probability to win on balance from a high proportion of its small opponents. This also helps the large futures trader to win even more from smaller traders as time goes on. In futures trading, as in so many other areas of financial endeavor, the nature of the game favors the rich getting richer.

Good Bets

The player making a good bet, which may be referred to as favorable or positive, has in her favor a mathematical expectation of winning money each time she makes it. A game consisting of one such bet or a preponderance of them is a favorable game. (Some consider each bet a game, and a series of bets would then be a series of favorable games, but the difference in semantics is of more interest to game theorists than to futures traders.) Positive expectation merely requires some combination of probability and payoff (including the cost of playing the game) that makes the bet or game financially favorable to the player. The coin flipper, for example, may be betting even money that he can flip one head before his opponent flips two, or he may be betting that he will flip a head before his opponent flips a tail, but he will win a dollar if he wins and lose 50 cents if he loses. He may need to flip one head to win a dollar at the risk of losing one dollar if his opponent flips a tail, but he gets paid a dime for playing the game. Better still for the fortunate player such as a racetrack which has a positive expectation of winning a high proportion of wagers placed but still charges its patrons for the opportunity of entering the premises, to say nothing of collecting fees for allowing them to park their cars outside, is some combination of these favorable terms.

Bad Bets

One might ask why individuals would make bad bets, that is, those in which they have a negative expectation when probability and payoffs are considered. One reason, of course, is that some players do not realize that their bets are bad or how bad they are. Others choose to play in negative games, knowing that they are unfavorable, because they have motivations explained by psychological drives rather than logically based financial factors. Presumably some people find a masochistic pleasure in losing or pride themselves on their courage in playing David to the bookmaker's Goliath. Some maintain that they enjoy playing the game enough to warrant the inevitable cost of playing, but here again the subjective world of individual psychological makeup (or mix-up) would have to be examined. This chapter assumes that the reader is interested in making good bets and playing favorable games.

In passing, it might be noted that there can be a high probability of eventually winning a game by ruining the opponent, even in a game in which each bet is bad, provided that it is not *too* bad and that the player making the bad bets has capital materially exceeding that of his opponent and that bets are large. This happy circumstance, however, can never accrue to a futures trader who is trading badly because he is always small in relation to the combined size of his opponents. Large traders who tried to overcome an unfavorable approach to futures trading would almost certainly find themselves among the small traders within a reasonably short time.

Strategy for a Favorable Game

Futures traders typically have, or think they have, a positive expected payoff, and it is that kind of game that is examined in more detail for a logical approach to ultimate victory. Readers should not treat this subject lightly. The *manner* in which they play the futures trading game is far more likely to cause their ultimate success or failure than is any other aspect of their trading, including their method of selecting trades.

It would be of considerable value if a money management strategy applicable to all traders could be offered here. This is impossible, however. The number of possible variables in the solution of all possible trading strategy problems would extend this book into at least a 5-foot shelf. Factors that would have to be considered include not only differences in personal attitudes toward profits and losses but also the specific probabilities that traders believe are inherent in the trades they select. The varying differences in probabilities of success and various ratios of profit to loss, differences in commissions, and different possible combinations of "good trades," "better trades," and "best trades" make for a huge number of possible variations. A single trader with an elaborate system of selecting trades may enter positions with wide variations in probabilities, payoffs, temporary adversity possibilities, commissions, required capital commitments, and time requirements. Too, there may be times when certain completely unexpected events create biases that were not taken into consideration and unexpectedly cause many simultaneous positions to have good or bad results at the same time. A trader, for example, may have long positions in four futures presumed to be reacting to different forces, with all four trade entries based on apparently independent technical signals. An event may occur that will prove to be bearish on *all* futures, and the trader will suffer four losses. Had he been short, he would have had four profits.

An individual trader facing this problem must consider the data he has available that apply to his own methods of trade selection and, even recognizing some of the subjectivity in money management and determination of probabilities, at least do his best to solve his problem logically. This is considerably better than making decisions haphazardly and hoping that everything will turn out well. The numbers that might apply to a mythical trader and what they mean to her should be a useful subject for detailed examination.

Assume that a trader has initial trading capital of $10,000. She has developed a technical trading method that she believes will indicate trade opportunities that will offer a profit opportunity equal in dollars to the risk of loss when commissions and other execution costs are considered. On the basis of her research or experience, the trader believes that her chance for a profit on any given trade is .55 and that her chance for a loss, therefore, is .45. Her mathematical advantage on each trade is .10. (She may feel that some trades will give her more advantage than that, but she has learned to temporize optimism and always take the conservative approach to any of her trading decisions.) Assume also that the trader plans to trade indefinitely rather than aim for some specific objective, that no change is expected in her presumed probabilities on the basis of her continuing research, and that her attitudes toward her gains and losses will remain unchanged as her fortunes ebb and flow. If she is successful, her gains could range between reasonably satisfactory and huge, depending on the frequency of her trades. As she proceeds from her research into real-time trading, the trader should be alert to benchmarks to make sure that she is on course.

Real-Time Validation

As has been indicated, life in the real world has a way of being more difficult than paper trading has shown it should be. Traders implementing their untested plans should make some effort to be sure that they are "on course." The statistics will vary with the plan being used, results expected, and degrees of variation from the expected acceptable to the trader, but at some point a method counted on to yield a given number of profits should begin yielding them.

The trader who anticipates a 10 percent advantage could make use of the figures in Table 10-1. This table can help to show him how many losses he should have suffered in a given number of trades. Suppose, for example, that he has taken three losses in his first five trades and is concerned because he believes he should have had only two. The first line of Table 10-1 indicates that he has a probability of .9497 of having more than zero losses, .7438 of having more than one, .4069 of having more than two, .1312 of having more than three, and .0185 of losing on all five. Three losses in five trades represent more than 40 percent, and in the column headed by "40" he will note that the chance of three or more losses was

.4069. Three losses in five trades, therefore, should come as no great shock. By the same token, if he had lost on all five of his first five trades, he should also note carefully that there was a chance of only .0185 of this happening if in fact his probability of winning had been .55. Some traders might go back to their paper trading for a while, even at this early juncture, but others might go on trading despite the uncomfortable odds of more than 50 to 1 that the real world is not doing what their paper worlds said it should. If after 30 trades such a trader has had more than 18 losses (more than .60, hence $P = 60$), he will know that he is still in an unpleasant area with only a .0334 chance of being right, and if he has had more than 21 losses, the chance of his being on a satisfactory course is an almost ridiculous .0016. As he approaches his hundredth trade, his percentage of losses should be clearly closing in on the expected .45. The chance of anything over .50 losses at this level is only .1574; over .60, only .0013. And over .70, the chance statistically approaches the impossible.

TABLE 10-1

Probability of More Than p Percent Unsuccessful Trades
with a Probability .55 of Winning (10 Percent Advantage)*

No. of Trades	P→ 0	10	20	30	40	50	60	70	80	90	100
5	.9497		.7438		.4069		.1312		.0185		.0000
10	.9975	.9767	.9004	.7340	.4956	.2616	.1020	.0274	.0045	.0003	.0000
20	1.0000	.9991	.9811	.8701	.5857	.2493	.0580	.0064	.0003	.0000	.0000
30	1.0000	1.0000	.9960	.9306	.6408	.2309	.0334	.0016	.0000	.0000	.0000
40	1.0000	1.0000	.9993	.9717	.7376	.2624	.0283	.0007	.0000	.0000	.0000
50	1.0000	1.0000	.9998	.9835	.7615	.2385	.0165	.0002	.0000	.0000	.0000
60	1.0000	1.0000	.9999	.9903	.7820	.2180	.0097	.0001	.0000	.0000	.0000
70	1.0000	1.0000	1.0000	.9942	.7998	.2002	.0058	.0000	.0000	.0000	.0000
80	1.0000	1.0000	1.0000	.9965	.8156	.1844	.0035	.0000	.0000	.0000	.0000
90	1.0000	1.0000	1.0000	.9979	.8294	.1706	.0021	.0000	.0000	.0000	.0000
100	1.0000	1.0000	1.0000	.9987	.8426	.1574	.0013	.0000	.0000	.0000	.0000
150	1.0000	1.0000	1.0000	.9999	.8909	.1091	.0001	.0000	.0000	.0000	.0000
200	1.0000	1.0000	1.0000	1.0000	.9209	.0791	.0000	.0000	.0000	.0000	.0000
250	1.0000	1.0000	1.0000	1.0000	.9440	.0560	.0000	.0000	.0000	.0000	.0000
300	1.0000	1.0000	1.0000	1.0000	.9592	.0408	.0000	.0000	.0000	.0000	.0000
400	1.0000	1.0000	1.0000	1.0000	.9778	.0222	.0000	.0000	.0000	.0000	.0000
500	1.0000	1.0000	1.0000	1.0000	.9877	.0123	.0000	.0000	.0000	.0000	.0000

* In this table and in Tables 10-2 and 10-3 probabilities shown for trades 5 through 30 were derived from binomial distributions; for 40 through 500 they were derived from normal distributions that approximate binomial distributions.

Tables 10-2 and 10-3 provide the same information for traders who believe that they have a probability advantage of .20 (.60 – .40) or .30 (.65 – .35). Traders with greater advantages have an inkling much sooner than those with smaller advantages of whether they are on course, and at each level the chance of their judging correctly whether they are on course is higher than the chance for those with smaller advantages at the same level. A trader with a .30 advantage, for example, who has traded 100 times and who has had more than 50 losses, knows that there are only eight chances in 1000 that his real-world trading is in line with his researched expectations.

A trader following her program has two tasks in the area of validation. One is determining statistically or by excellent judgment whether her results are approaching her expectations at various levels of real-time trading. The other is deciding on the level that will cause her to abandon this method if results are less than favorable. One trader with losses indicating only a .20 chance of his being right may continue trading, whereas a second may go back and do more research, and a third may throw up his hands in disgust and buy U.S. Treasury bills.

TABLE 10–2

Probability of More Than p Percent Unsuccessful Trades with a Probability .60 of Winning (20 Percent Advantage)

No. of Trades	*P* → 0	10	20	30	40	50	60	70	80	90	100
5	.9222		.6630		.3174		.0870		.0102		.0000
10	.9940	.9537	.8328	.6178	.3670	.1663	.0548	.0123	.0017	.0001	.0000
20	1.0000	.9964	.9491	.7501	.4045	.1277	.0222	.0017	.0001	.0000	.0000
30	1.0000	.9997	.9829	.8238	.4216	.0972	.0083	.0002	.0000	.0000	.0000
40	1.0000	.9999	.9951	.9017	.5000	.0983	.0049	.0001	.0000	.0000	.0000
50	1.0000	1.0000	.9981	.9256	.5000	.0744	.0019	.0000	.0000	.0000	.0000
60	1.0000	1.0000	.9992	.9430	.5000	.0570	.0008	.0000	.0000	.0000	.0000
70	1.0000	1.0000	.9997	.9561	.5000	.0439	.0003	.0000	.0000	.0000	.0000
80	1.0000	1.0000	.9999	.9661	.5000	.0339	.0001	.0000	.0000	.0000	.0000
90	1.0000	1.0000	.9999	.9736	.5000	.0264	.0001	.0000	.0000	.0000	.0000
100	1.0000	1.0000	1.0000	.9794	.5000	.0206	.0000	.0000	.0000	.0000	.0000
150	1.0000	1.0000	1.0000	.9938	.5000	.0062	.0000	.0000	.0000	.0000	.0000
200	1.0000	1.0000	1.0000	.9981	.5000	.0019	.0000	.0000	.0000	.0000	.0000
250	1.0000	1.0000	1.0000	.9994	.5000	.0006	.0000	.0000	.0000	.0000	.0000
300	1.0000	1.0000	1.0000	.9998	.5000	.0002	.0000	.0000	.0000	.0000	.0000
400	1.0000	1.0000	1.0000	1.0000	.5000	.0000	.0000	.0000	.0000	.0000	.0000
500	1.0000	1.0000	1.0000	1.0000	.5000	.0000	.0000	.0000	.0000	.0000	.0000

TABLE 10-3

Probability of More Than p Percent Unsuccessful Trades with a Probability .65 of Winning (30 Percent Advantage)

No. of	P→										
Trades	0	10	20	30	40	50	60	70	80	90	100
5	.8840		.5716		.2352		.0540		.0053		.0000
10	.9865	.9140	.7384	.4862	.2485	.0949	.0262	.0048	.0005	.0000	.0000
20	.9998	.9879	.8818	.5834	.2376	.0532	.0060	.0031	.0000	.0000	.0000
30	1.0000	.9981	.9414	.6425	.2198	.0301	.0014	.0000	.0000	.0000	.0000
40	1.0000	.9995	.9766	.7463	.2537	.0234	.0005	.0000	.0000	.0000	.0000
50	1.0000	.9999	.9869	.7707	.2293	.0131	.0001	.0000	.0000	.0000	.0000
60	1.0000	1.0000	.9926	.7938	.2062	.0074	.0000	.0000	.0000	.0000	.0000
70	1.0000	1.0000	.9957	.8098	.1902	.0043	.0000	.0000	.0000	.0000	.0000
80	1.0000	1.0000	.9975	.8258	.1742	.0025	.0000	.0000	.0000	.0000	.0000
90	1.0000	1.0000	.9986	.8401	.1599	.0014	.0000	.0000	.0000	.0000	.0000
100	1.0000	1.0000	.9992	.8527	.1473	.0008	.0000	.0000	.0000	.0000	.0000
150	1.0000	1.0000	.9999	.9003	.0997	.0001	.0000	.0000	.0000	.0000	.0000
200	1.0000	1.0000	1.0000	.9309	.0691	.0000	.0000	.0000	.0000	.0000	.0000
250	1.0000	1.0000	1.0000	.9512	.0488	.0000	.0000	.0000	.0000	.0000	.0000
300	1.0000	1.0000	1.0000	.9653	.0347	.0000	.0000	.0000	.0000	.0000	.0000
400	1.0000	1.0000	1.0000	.9819	.0181	.0000	.0000	.0000	.0000	.0000	.0000
500	1.0000	1.0000	1.0000	.9905	.0095	.0000	.0000	.0000	.0000	.0000	.0000

PROBABILITY OF RUIN

Conceptual Foundation

Success presents few problems to most traders; it is the loss of trading capital, or ruin, that must be considered primary. Consideration of ruin demands an early decision—and one of the most critical decisions in the area of money management. The risk of ruin in favorable games increases directly as more of the available trading capital is utilized for each trade. Increasingly conservative approaches also result in less profit potential, either because less will be gained on each winning trade or because there will be fewer trades. An intelligent median must be chosen.

Assume that the trader decides to use \$2500, or one-fourth of his \$10,000 capital, for each trade and plans to continue making \$2500 commitments indefinitely. His risk of ruin is heavily concentrated in the early stages of his trading program. If he loses on his first two or three trades, he is in serious trouble, and if he loses on his first four trades, he is out of the trading business. The chance of his losing on his first trade is .45. His chance of losing on all four of his first four trades is only $(.45)^4$, or .04. If he is ahead after the first four trades and finds himself with trading capital five or six times the size of his $2500 commitments, four losses (consecutive or net) can no longer ruin him; but then he also faces an increasingly high probability of having more than four net losses as he continues his trading over time. The probability R of his eventual ruin is given by the formula

$$R = \left(\frac{1-A}{1+A}\right)^C$$

where A is the trader's advantage in his trades expressed in decimal form and C is the number of trading units with which he begins.[1] If a trader is willing to risk one-third of his capital in a trade, he has three initial trading units. If he risks one-twentieth, he has 20 trading units. The trader being considered here will risk $2500 of his $10,000 on each trade and so has four trading units when his trading begins. His chance of eventual ruin is $[(1 - .1)/(1 + .1)]^4$, or .45. He may find this number uncomfortably high and may examine his chance of succeeding if he risked only one-tenth of his capital on each trade rather than one-fourth. The trader may consider survival more important than maximizing expected profits as fast as possible but having to accept more risk to do so. Some traders, of course, may choose maximization and accept the added risk that goes with it. The risk of only $1000 of the trader's $10,000 capital on each trade provides a dramatic example of the virtue of taking small risks if survival is the major motivation. The chance of losing all of the $10,000 capital in the first 10 trades drops to $(.45)^{10}$, or less than one chance in 3000. Even if he continued to trade indefinitely, risking $1000 on every trade in order to gain $1000, his chance of ruin would be only .1341. The probability of success on any given trade has remained unchanged, but the trader's chance of survival has increased from .55 to .87 merely by his trading on a more conservative scale.

One of the most difficult and important decisions to be made by the trader is what to do if his account grows on schedule, thereby further indicating that his favorable research projections were correct. If his original

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[1] William Feller, *An Introduction to Probability Theory and its Applications,* 3d ed. (New York: John Wiley & Sons, 1967). A good source of basic probability theory is Samuel Goldberg, *Probability: An Introduction* (Englewood Cliffs, N.J.: Prentice-Hall, 1960).

capital of \$10,000 has grown to \$20,000, his chance of being ruined if he continues trading on a scale of \$1000 has become much smaller than the original .1341 because it would now take 20 net losses rather than 10 to ruin him. The probability of this happening is only .018. The chance of his continuing to add to his capital over time becomes more and more certain as it builds in size if he does not greatly increase his scale of trading. Having reached \$20,000, he has an even greater chance of reaching \$30,000, and having reached \$70,000, say, he has a chance of then reaching \$80,000 that is even greater still. On the other hand, when the trader reached \$20,000, he could have become more aggressive. He could have begun trying for \$40,000 with the same degree of probability as he originally had of reaching \$20,000 from \$10,000. The chance R of being ruined before reaching a higher specified level from any given starting point is provided by the formula

$$R = \frac{[(1+A)/(1-A)]^{W} - 1}{[(1+A)/(1-A)]^{C+W} - 1}$$

where A is the trader's advantage, C is the original trading capital expressed in trading units, and W is the number of those same-sized units he hopes to accumulate.[2] In the case of the trader being considered in detail here, his original capital is \$10,000, which represents 10 trading units. With his .10 advantage his chance of getting to \$20,000 successfully is .8815. If he arrives at the \$20,000 level and chooses to try for \$40,000 by using \$2000 units of trading, his chance of arriving at \$40,000 is again .8815. Each time he doubles his money, he will have the same chance of doubling it again by doubling his trading units. This assumes that he will not eventually find himself trading on a scale that will raise market liquidity problems, thereby decreasing his assumed .10 advantage, and that he will not pass his "stress point" and damage his judgment. Such a program may seem quite exciting because a trader has to double his original \$10,000 only seven times to accumulate \$1,280,000. Before he is too quick to give up his virtual certainty of continuing to accumulate money (if he never raises his scale of trading), he should realize that if he doubles his scale of trading, his overall risk of ruin will increase considerably. The chance of success in seven successive series with a chance of .8815 of winning each series is $(.8815)^7$, and the chance of ruin is $1 - (.8815)^7$, or an uncomfortable .5866. Even this may be exaggerating the real chance of

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[2] Ibid.

success because (*a*) the presumed .10 advantage may have some high hopes mixed in with the research; (*b*) independence of results often does not exist, which makes runs of "bad luck" more likely than the computed probabilities would indicate; and (*c*) the growth of execution costs and market liquidity problems, as capital grows, becomes increasingly likely.

Traders must work out their own probabilities, given their own facts, judgments, and attitudes, but it may be of interest to note in Table 10-4 the probabilities faced by traders with advantages of 10, 20, and 30 percent in their favor on each trade, including all costs, with payoffs equaling losses. The effects of different sizes of commitments and the length of time during which trading is planned to continue become quite clear. For example, if a trader has an assumed 10 percent advantage, capital of $10,000, and a plan to risk $2000 (one-fifth of her capital; hence her capital represents five original trading units), with the payoff and dollar risk also $2000, and if the trader expects to trade indefinitely, her chance of success will be .633 and her chance of ruin .367. If she reduced her exposure and objective on each trade to $1000, her chance of long-term success would increase to .866 and her chance of ruin would drop to .134. If a trader thought that her advantage was .30 (.65 – .35), her chance of ruin (if she risked only one-tenth of this capital and traded indefinitely without increasing her scale of trading, if successful) would be a minuscule .002. It should be obvious that a greater advantage vastly increases the chance of success in trading, just as it does in gambling; but it should now also be obvious that a trader with less probability of success who trades conservatively can actually have a better chance of long-term success (winning the game) than a trader with a higher probability of success who chooses to trade more aggressively. The trader with a .30 advantage, using one-fourth of her initial capital on each trade, faces a chance of ruin of a little more than .08. The trader with only a .10 advantage, however, can achieve about the same low risk merely by trading in units of one-twelfth of her capital. The outlook for the time that it would take for each to make important profits, assuming success, would vary considerably.

Multiple Positions

The problem of how much of a trader's available capital should be committed to one trade is compounded when the trader decides to add lines to an original position. This may occur when he follows a program of averaging or when he believes that he has a new reason for taking a position beyond that already existing. This might happen, for example, when a chartist is

TABLE 10–4

Trader's Chance of Ruin with a .10, .20, or .30 Advantage in Attempting to Either Double the Initial Capital or Trade Indefinitely

		.10 Advantage Probability of		***.20 Advantage Probability of***		***.30 Advantage Probability of***	
C	***W***	**Success**	**Ruin**	**Success**	**Ruin**	**Success**	**Ruin**
1	1	55	45	60	40	65	35
1	∞	18.2	81.8	33.3	66.7	46.2	53.8
2	2	59.9	40.1	69.2	30.8	77.5	22.5
2	∞	33.1	66.9	55.6	44.4	71.0	29.0
3	3	64.6	35.4	77.1	22.9	86.5	13.5
3	∞	45.2	54.8	70.4	29.6	84.4	15.6
4	4	69.1	30.9	83.5	16.5	92.2	7.8
4	∞	55.2	44.8	80.2	19.8	91.6	8.4
5	5	73.2	26.8	88.4	11.6	95.7	4.3
5	∞	63.3	36.7	86.8	13.2	95.5	4.5
6	6	76.9	23.1	91.9	8.1	97.6	2.4
6	∞	70.0	30.0	91.2	8.8	97.6	2.4
7	7	80.3	19.7	94.5	5.5	98.7	1.3
7	∞	75.5	24.5	94.2	5.8	98.7	1.3
8	8	83.3	16.7	96.2	3.8	99.3	.7
8	∞	79.9	20.1	96.1	3.9	99.3	.7
9	9	85.9	14.1	97.5	2.5	99.6	.4
9	∞	83.6	16.4	97.4	2.6	99.6	.4
10	10	88.1	11.9	98.3	1.7	99.8	.2
10	∞	86.6	13.4	98.3	1.7	99.8	.2
11	11	90.1	9.9	98.9	1.1	99.9	.1
11	∞	89.0	11.0	98.9	1.1	99.9	.1
12	12	91.7	8.3	99.2	.8	99.9	.1
12	∞	91.0	9.0	99.2	.8	99.9	.1

KEY: *C* is the trader's initial capital in units; *W* is the number of additional units the trader is attempting to gain; the symbol "∞" indicates that the trader expects to trade indefinitely. The format of this table was derived from Edward O. Thorp, ***Beat the Dealer*** (New York: Random House, 1962), p. 63.

following various signals and notes a second signal which indicates that he should enter a position when he already has a similar one based on a previous chart signal. He might conclude that these signals should be treated separately and distinctly or even that the second signal will reinforce the first and make its favorable outcome more certain. This situation deserves some thoughtful consideration before it is carried too far. No reason for adding units to an open trade makes a favorable outcome certain. A large number of signals all followed will eventually cause a trader to hold a position so large that an unfavorable outcome will ruin him.

To deal with this situation, which results in great opportunity accompanied as usual by great risk, the trader should consider a protective policy. One such policy might be a limitation on the number of multiple lines to be accepted. This, in turn, will depend on how large his trading capital is and how great a risk he thinks each unit entails. A trader who risks only 2 percent of his capital on each line will still be risking only about 8 percent on four lines of the same future. An 8 percent loss is painful but not disastrous. A trader who risks 15 percent on a line, however, would find himself with a loss of about 60 percent if all four lines failed.

Stop-Loss Points

When the trader has determined how much risk he is willing to face in a trade, he has a starting point from which he will determine his stop-loss level and, it is hoped, place an actual stop-loss order. If he believes that a logical stop-loss can be placed at a point involving less than his acceptable maximum risk, the closer stop is, of course, to be preferred. Placing stops may involve many criteria, some of which are regarded as important by some traders but not by others. It would appear that there are two considerations that cannot be ignored by any trader. First is the amount of money that would be lost if the stop were violated. Second is the current price volatility of the future being traded. In regard to the first of these points, whether the stop points themselves are based on the current market price of a future, the margin required, a chart point, or the day of the month multiplied by the phase of the moon, the number of dollars of loss, including execution costs, can easily be expressed as a percentage of the trader's capital. The trader should also have an informed idea of the maximum number of net losses he may reasonably have to suffer, based on his experience or research. If he risks so much that reasonable adversity will ruin him, his route is suicidal. It should be reiterated that ruin does not consist of a series of losses; it consists of a series in which the number of losses exceeds the number of profits by enough to cause ruin, regardless of their order. For example, if a trader with $4000 risks a total of $1000 on each trade, she will be ruined if she loses four times in a row. She will be just as ruined, however, by a bad period during which she has four patterns of one profit followed by two losses. She will have four profits, eight losses, and no money, even though she never had more than two losses in a row. Because an adverse series becomes increasingly likely as trading is carried on over time, it is obvious why trading too large a position is so deadly.

The second point that must be considered by any trader determining stop points is the degree of volatility in the markets he or she is trading. Traders who base their stops on current prices or chart patterns must take into consideration how logical stop-loss points may change drastically as futures are traded at higher or lower levels or as current volatility becomes greater or less. Stop-loss levels should be adjusted to recent volatility, but even this must be defined by the trader on a logical and validated basis. Is "current" defined as the range of prices for the last week, month, 6 months, or something else? Of course, next week may prove to be greatly different from last week, but this is an unavoidable risk that always accompanies speculation. Volatility, like most of the other vital data in futures trading, is fluid and nonstationary, unlike the more stable mass of data to be considered by coin flippers, poker players, and dice shooters. The importance of stop-loss strategy cannot be overestimated. This element of strategy will affect the trader's mathematical expectation in the following manner. If the stop-loss is placed far from the current price, the probability of losing will be small but the amount of the loss may be large. If the stop-loss is placed close to the current price, the probability of losing will be greater but the amount of the loss will be small. Consistently placing stops too close and getting stopped out in "noise" areas or placing stops so far away that the inevitable losses will be unreasonably large will lead to almost certain ruin.

Strategy Following Significant Success

When an account has grown impressively, a trader has a difficult decision to make, but it cannot be avoided. If a $10,000 account has grown, on schedule, to $20,000, which was the objective hoped for when trading in futures was started, the action to be taken is obvious. A check is requested and deposited in a convenient savings and loan institution, and the futures account is closed. If, however, the trader is thinking in terms of acquiring a chateau in France, a chauffeured limousine, and a cellar of Rothschild wines, he must prepare for the next phase of his trading. Again, no definitive course of action acceptable to all traders can be marked out here, but the alternatives are clear. The trader can leave well enough alone and continue trading in the same way and on the same scale as before. Now that he has $20,000, however, he may be concerned that if he trades on the same scale as he did when he had only $10,000, half of his new level of capital will appear to be idle. If he chooses instead to double his scale of trading, he can achieve his ultimate goals faster, if he reaches them at all, but with the usual added risk and stress. If he doubles his commitment to each trade in his effort to reach $40,000 from $20,000 as rapidly as he reached $20,000 from $10,000, he risks finding himself back at $10,000 in only half that time. After all, it took 10 net successful trades, each yielding a $1000 gain, to reach $20,000, but it would take only five net trades, each resulting in a $2000 loss, to bring his trading capital back down to $10,000. A delicate balance of probabilities and personal feelings must be considered by each trader at critical points such as these and decisions made according to his own mix of knowledge and emotions.

Strategy Following Significant Adversity

Even presuming that a trader's basic method is viable, if adversity precedes success, she will find her position difficult. The fact that failure came first does not ensure that success is inevitable after that point. All that is completely certain is that the trader's capital is impaired. If she continues to take risks similar to those she has already taken, the chance of ruin becomes ever greater. Most traders would choose to employ a defensive strategy, but here again there is a price to pay.

A defensive strategy can consist basically of one of two courses of action. One is the elimination of trades, for the time being, that have the least chance of success. The other is the elimination of any trades that require the risk of too many dollars in relation to the lower level of the account. Of the two the second would appear to be the better. Regardless of the quality of a trade, the probability of success is never 1, and therefore there is always some chance of loss. Furthermore, trades that are known to have poor ratios of success to failure would never be utilized, regardless of the condition of the account. The range between the most acceptable and least acceptable trades for the typical trader is not wide, considering all the uncertainties of trading. It is unlikely that any trade can ever have much more than a .8 probability of success, and it is also unlikely that a trader would be willing to accept knowingly a trade below about .65 (assuming in both cases an even money payoff). This practical range of only about .15 does not provide much room to maneuver.

If there is a limit on dollar risk in relation to the total number of dollars in the account in a given trade, then trades exceeding this risk can, of course, be eliminated, but this will reduce the number of trades available to recover the dollars lost, and recovering money lost may take longer than losing it in the first place. If the trades with smaller risks also have smaller profit potentials, as is likely, the trader must again face an ugly statistic. He might have lost half his money by having a series of trades that yielded 10 net losses and followed with a new series yielding 10 net profits only to find that he was only halfway back to his original level of capital because his profits were smaller than his losses. A loss of 60 percent from a given level requires a profit of 150 percent merely to get even. Profits of 150 percent are not easy to achieve, getting even is not the most exciting goal, and, of course, the trades entered to attempt recovery would themselves entail the risk of further loss.

Systems

The trader, like the gambler, should learn early the fruitlessness of wasting time and money trying to profit from a game with a negative expectation by the use of some clever strategy. It is to be hoped that a trader's research has resulted in some method of selecting trades that will yield better results than random selections. The mathematical expectation of a game is not affected by the strategy of varying the size of individual bets. If a trader has a valid method that yields on the average 65 wins for 35 losses in a series of independent trials, he will have the same ratio of wins to losses, regardless of his betting strategy, and no system of risking more or less, depending on the result of his recent trades, will change the ratio. If a game is fair, it will remain fair; if it has a positive expectation, it will remain positive, and if negative, it will remain negative, and the latter two will maintain their biases with no change in degree.[3] No mechanical system can change probabilities one iota.

Money management "systems" designed to overcome a negative expectation in any game, whether trading or gambling, are usually based on some common misconceptions about the statistical law of large numbers, itself frequently incorrectly called the "law of averages." The designers of systems almost invariably depend on some theory that numbers will average out in time to yield profits. A coin having fallen tails a number of times owes some heads, and so one should bet on heads to take advantage of the certainty that the average number of heads flipped will approach 50 percent of all flips sooner or later. A coin, however, has neither a memory

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[3] Richard A. Epstein, *The Theory of Gambling and Statistical Logic,* rev. ed. (New York: Academic Press, 1977), p. XIV. Some of the conclusions that follow were drawn in part from this same scholarly reference, especially its section entitled "The Basic Theorems," pp. 52–73.

nor a conscience, and one may overlook the significance of the difference between percentages and absolute numbers. Certainly, as the coin is flipped longer and longer, the percentage of heads or tails flipped will inevitably approach 50, but not because a short-term series of tails will be immediately followed by a series of heads. Rather, in the long run, the law of large numbers declares that a large number of subsequent trials will overwhelm any apparent aberrations in any part of the series. In a word, as a game is played longer and longer, the *percentage* of wins and losses will inevitably approach the statistical expectation, but seemingly unusual differences will occur just as inevitably. A pattern of 100 flips of a coin alternating precisely from heads to tails would be almost as miraculous as a consecutive series of 100 heads or 100 tails. This means that streaks of luck (both good and bad) are expectations, not aberrations.

Although variation in the sizes of bets will not change the statistical chance of ultimately winning or losing the game (if the size of bets is varied), the ultimate amount of money won or lost and the time it will take to win or lose could be affected. This results entirely from the different average level of capital involved in the game, not a change in the probability of winning or losing on each game or trade. A betting system intended to overcome the disadvantage of a basically bad bet is sometimes called the "gambler's fallacy," and it could be called the "futures trader's fallacy" just as well. The number of futures traders who have spent good money for systems and who have lost money following them is legion, as is the number of gamblers who have followed the same ruinous path.

Betting and trading systems are sought with more zeal than are perpetual motion machines and sources of everlasting youth. The chance of finding a reasonably simple system that will consistently "beat the odds" is no greater than the chance of satisfying a craving for any other delusion, but the idea refuses to be laid peacefully to rest. There will probably always be people who believe that the coin being flipped, having yielded a series of heads, is due for tails, the clear fallacy of the "maturity of the chances" notwithstanding.[4] A series of bad trades having been suffered just as clearly will indicate to many that a series of good trades is due. Bad

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[4] The "maturity of the chances" is a doctrine that, in effect, attempts to assign dependence to basically independent events by attributing to them a memory that they lack by definition. A roulette player may, for example, bet on black after four consecutive reds have come up because a black "is due." The poker player, having failed to complete the last few straights and flushes that he tried for, believes that the next one will be achieved almost with certainty. The horse player may play the favorite each time three favorites in a row have lost because, after all, most of them should win each afternoon.

luck indicates that good luck is coming and vice versa as surely as a pendulum will retrace its path. This idea of retribution or symmetry permeates philosophical thinking throughout history, back to the ancient Chinese, and will probably influence the actions of gamblers and traders as long as dice roll and people trade in securities and futures.

All systems, regardless of their complexity, are based on wagering or trading that depends on the outcome of previous trials. Some of these systems, which involve multiplicative, additive, or linear betting, can become extremely complex, but the basic premise remains the same. Linear systems have a fixed additive constant. Additive systems increase stakes at an arithmetic rate. Multiplicative systems increase bets geometrically, depending on the immediately preceding result. One of the best-known geometric systems is the "Martingale." The Martingale system has many proponents because many people who have used the system have won games and credit the system with the win, whereas actually all it has done is offer a high probability of small gains and a small probability of a large loss. If the system is used for a long period of time, however, the chance of suffering a large loss becomes greater. If the game is continued indefinitely, the large loss becomes certain. The basic idea behind Martingale (or any other progression system) is that the bet size will be increased each time a bet is lost until a win covers the most recent string of losses and leaves the player even or ahead. For example, a player who loses one unit can follow by betting two. Therefore, if he wins, he will be ahead one unit, and if he loses, he will be behind three. If he wins, he will bet one unit and start a new series. If he loses, he will bet four units. If he wins, he will be ahead a total of one unit and start a new series. If he loses, he will be behind seven units and will bet eight. Sooner or later he will win, and when he does, he will be ahead one unit for his series. He therefore figures to win one unit for each series, although some series will be longer than others.

The Martingale player soon finds out, however, that he is caught between two bet (or trade) limitations: the lower and the upper. If the least he can bet or use as margin is reasonably close to the upper limit, it will not take many progressive increases of his bets following losses to equal or exceed the upper limit. In gambling the lower and upper limits are determined by the casino. In trading the lower limit is determined by the margin requirement and the upper by the capital or stress point of the trader or liquidity problems in markets; hence good results as bets become larger become increasingly unlikely. The time required for a progression to become unreasonable in trading is undoubtedly shorter than in gambling, and the time available even in gambling is too short in itself for long-term success to be expected. The gambler forced to double his $1 bet in a series of 20 losses would have to risk more than a million dollars to have the opportunity of winning his series on the twenty-first bet. This is ludicrous enough even without considering that minimum bets must often exceed $1 and that a house limit often restricts the maximum to about $500. The ninth loss of a geometrically increased $2 bet would carry the player past a $500 house limit. The player might argue that nine losses in a row are highly unlikely. This is true for any particular series of nine bets, but the player who continues playing for a long period will almost certainly have nine losses in a row sooner or later, as will the futures trader.

The system player would do well to test her system against a random-number table. If ostensibly it can, say, double her capital before she loses it with a high degree of probability in a game involving many independent events, then merely by "betting smart" she should be able to beat the random-number table in a paper game by doubling her capital three or four times in long games before she is ruined. (A person who did this and published her results would have the first such publication in history.[5])

Size of Commitments

Despite the fact that varying the size of commitments will not change probabilities, it could well change an outcome by ending the game sooner or later than might otherwise be the case. The trader, as well as the gambler, must be vitally concerned with loss of the money he has available for trading because its loss eliminates any chance of winning or even trading unless he can later replace his capital. In a word, ruin precludes success and must be avoided if at all possible. Sizing of commitments according to the nature of the game has a vital effect on the possibility of ruin. The correct guiding principles may surprise many traders and gamblers. For fair or unfavorable games, the strategy of betting should be aggressive, and for favorable games, the approach should be conservative.

If a futures trader who regarded futures trading as a basically losing game intended to take only one position and had a specific money objective in mind, his best strategy would be precisely the same as that of a gam-

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5. An elaborate discussion of systems may be found in Allen N. Wilson, *The Casino Gambler's Guide* (New York: Harper and Row, 1970), pp. 234–258. The mathematics of system fallacies is covered in Epstein, loc. cit.

bler facing the same problem. If the expectation of a profit is negative or zero, but the game is still to be played for some reason, the best chance available to reach the objective is obtained by making a large commitment and playing the game only once. Of course, the capital might be lost and the objective not reached, but the probability of reaching the objective is less for any other strategy. As one decreases the size of one's commitments in an unfavorable game, the chance of eventually reaching one's objective becomes ever smaller and the chance of ruin greater.

The informed futures trader, unlike the gambler who competes against a casino's odds, is presumed to be playing a favorable game against a far better capitalized adversary (the market) and should wager accordingly. Her wisest policy is simple. *She should trade on a small scale.* The specific amounts risked, of course, depend on the size of her capital, her objectives, and how long she expects to continue her trading. If she intends to trade indefinitely, her positions should be modest in relation to her capital, and errors should be made on the conservative side. Because the probabilities favor her winning in the long run, her primary objective in the management of her capital is to make every effort to *reach* the long run. The best way to defeat herself is to risk so much that she cannot realistically recover from adversity on one trade or a series of bad trades. Regardless of how good the odds are, there is some chance of losing, and there is a certainty of periods of severe adversity even when the system used is valid and the expectation favorable. The longer a game is played, the more inevitable such periods of adversity become. Adverse runs should not be surprising. They are to be expected and should be planned for. The best way is to expose so little capital that ruin will not be the result when nothing seems to go right.

The trader who maintains that his research is valid and that he has a positive expectation on every trade may argue that he can afford to risk one-fourth of his capital on every trade because the chance of his losing four times in a row is quite small. He would be correct in making this assertion, but he should think further before engaging in such an aggressive course. The chance of losing four times in a row, even with favorable probabilities, becomes quite high after several series and after a long series is virtually certain. Even worse is the fact that the trader does not need four losses in a row to be ruined; he needs only one point in his series of trades at which he has lost on four trades *on balance.* Even with a high expectation of success on any given trade, his chance of surviving a long game without being a net loser by four trades at any given time would be poor. If the capital risked were reduced from one-fourth to one-tenth, the chance of being ruined on any series of 10 trades would be infinitesimal and his chance of surviving a long series of trades would become high. In any case, the trader must determine the size of his commitments by his probability estimates, the payoffs, and his own degree of optimism with regard to what his trading talent is worth.

In summary, frequent small commitments in a favorable game will almost certainly yield an ultimate profit, whereas continued large-percentage commitments will almost certainly cause ruin. In an unfavorable game large commitments made over a short duration provide the only chance of winning and the best expectation (or rather the least bad expectation) results from playing once. One who is ahead in a game with a negative expectation may be said to be losing at a negative rate. If one with a dollar to risk insists on playing a slot machine, his best strategy is to bet his entire dollar in a one-dollar machine and then quit, win or lose, rather than put 20 nickels in a nickel machine.

The inviting, but usually fatal, temptation to bet too heavily in favorable games is probably what leads so often to the most usual type of overtrading; that is, risking too much of one's capital on any one trade. The other types of overtrading, which include trading too many positions at the same time and trading too often, may also cause severe damage, but trading on too large a scale is probably worst of all.

NOTES FROM A TRADER

If money management now appears to be an area that requires considerable thought, that is full of dilemmas and contradiction, and that is generally quite frustrating to the reader, he or she has made real progress. The first step in solving this problem, as in solving most others, is to recognize its existence and face up to it. Ignoring it merely because its solution is difficult and indefinite and relying instead on blind luck is hardly an intelligent alternative.

Money management principles contain so many decisions that must be made by traders on an individual basis that no specific program which is adequate for all traders can ever be devised. This does not mean, however, that some basic principles that are useful for all cannot be suggested. Some poker players like to bluff frequently, while others seldom or never bluff. There are winners to be found among those belonging to either school, most of whom think that those who do not agree do not know how to play poker. Those holding either conviction, however, cannot possibly make money by consistently drawing to bad hands and paying more for the privilege than the hand is worth. There are rules that must be followed by all traders and gamblers if they are to live long enough in the world of games to reach the long run while still solvent. Most of these rules for basic survival are to be found in the area of money management, in which few traders are especially interested, rather than in the area of trade selection, which is the basic interest of most of them.

A wise principle of money management is to make mistakes on the side of the too conservative. It is better to accumulate money too slowly than to lose one's trading capital quickly. If debating whether to buy one unit or two, buy none. If debating whether to take a position, pass it by. As an account grows, consider withdrawing some or all of the profits. If aggressiveness is desired, the number of dollars risked can increase as the account grows, but the risk percentage can be held unchanged or even reduced at the same time. The unexpected always seems to be costly rather than profitable. A trader who assumes that he will be right 65 times out of every 100 trades he makes each year assumes that he can look forward to about 30 winning trades net in the next year (65—35). Somehow a considerable number of things will go wrong. If he has a hundred trades and the number of net wins is not 30, it will almost certainly be smaller. He might find himself with only 20 net profitable trades instead of 30. Execution costs will be higher than expected, especially because bad trades will go further through his stops than he thought reasonable, but the less frequent windfall profits that should logically compensate seem rarely to arrive on time, and then they are smaller or more infrequent than had been anticipated. Errors will almost always impair results and rarely improve them. Oversleeping and missing the opening of the market will not cause one to miss a position that opens unfavorably, but a market that opens within a satisfactory range and then moves toward the trader's objective without any retracement is likely to result in an opportunity lost forever. If the market opens sharply in the anticipated direction, even the trader who wakes up on time may be inclined to wait and try to enter it at a more favorable level. If the market provides the hoped-for adversity, the trader will enter some trades that will work and some that will not. If adversity never comes, however, only the good trades can be missed, not the bad ones. With all this the trader might consider himself lucky to find himself with only about 10 net good trades remaining to make his year profitable. Even the most favorable "trading system" will depend for its ultimate favorable results on a surprisingly few net good trades. It does not take many errors (bad luck) to miss them. Furthermore, 65 correct decisions in a hundred was probably an overly optimistic estimate in the first place.

It is interesting to observe the way most futures traders play the futures game in relation to the possible ways that money games can be played:

1. The most effective approach to the objective of maximizing results is to play a favorable game on a small scale.
2. Less desirable, but still providing a reasonable chance of success, is playing a favorable game on a large scale with enough profits coming early in the game to avoid ruin.
3. A basically unfavorable game may yield profitable results (presuming that one insists on playing unfavorable games) if one plays seldom and bets heavily.
4. The only road that leads inevitably to disaster is playing an unfavorable game continuously.

The trader who trades on impulse or uses some other invalid method of making trading decisions is following the fourth route—which is crowded with bumper-to-bumper traffic.

Some of Finagle's laws as applied to speculators and market researchers are especially valuable to traders concerned with money management[6]:

1. If anything can go wrong with a research project, it will.
2. No matter what the result, there is always someone willing to fake a better one.
3. No matter what the result, there is always someone eager to misinterpret it.
4. No matter what occurs, there is always someone who believes it happened according to his pet theory.
5. In any collection of data the figure that is most obviously correct—beyond all need of checking—is the mistake.
6. Even if it is impossible to derive a wrong number, still a way will be found to do it.

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[6] Compiled in the original form by John W. Campbell, Jr., late editor of *Analog Science Fiction Magazine.*

In the area of money management, as in no other, traders should beware of self-deceit. Successful traders do not lie to themselves. They do not substitute hope for facts. Fagin's cynical comment in the musical production of *Oliver* is quite appropriate for consideration by an economically motivated trader attempting to evaluate the money management program that he or she has been using. "In this life, one thing counts, in the bank, large amounts!"

PART THREE

LOSERS AND WINNERS

In every game there are winners and losers. The scorecard in the futures game, which is brutally simple, consists merely of a credit or debit in a trading account over a period of time long enough to exclude luck, either good or bad, from playing a prominent role. Because more speculators lose than win, the part title makes allowance for that sobering fact by reversing the consideration of the outcomes.

Chapter 11—"Who Wins? Who Loses? And Why?"—studies the returns to the players of the futures game. Hedgers, large speculators, and small traders reflect varying trading results in the long run. Studies are examined to shed light on the question of the distribution of profits and losses and the skills employed by the winners. These skills involve behavioral as well as analytical competence, and one systematic approach to understanding the role of feelings and thoughts is presented.

11 CHAPTER

Who Wins? Who Loses? And Why?

Who Wins?
"The race is not always to the swift nor the battle to the strong—but that's the way to bet."

—*Damon Runyon*

Who Loses?
"The greatest tragedy in all history is the murder of a beautiful theory by a gang of brutal facts."

—*Anonymous*

Why?
"I contradict myself. I am large, I contain multitudes."

—*Walt Whitman*

INTRODUCTION

This chapter focuses on the results of those who play the futures game and suggests reasons for the outcomes. Some believe that long-run profitability is an achievable goal if prudent money management strategies are combined with exhaustive market analysis. Other market participants are more leery, having concluded that the road to success is populated only by those who possess the type of "nonpublic" information that enables them to buy soybeans in advance of a particularly bullish crop report or sell bonds prior to an increase in short-term interest rates by the Federal Reserve.

Other traders are even more cynical, reasoning that because futures trading is a zero-sum game, in which gains equals losses, the participants engage in a kind of suicidal rotation in which no one wins in the long run. In such a dismal circumstance the only possible advantage would be to the broker, if the commissions charged as "entry fees" for the game exceeded the broker's costs. Unless the shape of their trading curve indicates exceptionally active greed factors, most rational people might find such a game totally unsuitable.

The following studies are presented as evidence in the controversy. They represent a combined total of over 50 years of research into the trading results of every type of market participant. Summary conclusions of the studies follow their presentation.

DISTRIBUTION OF PROFITS AND LOSSES

The Blair Stewart Study

Probably the best-known analysis of the trading record of speculators is that by Blair Stewart, as a consulting economist for the Commodity Exchange Authority.[1] The complete trading records of 8922 customers of a Chicago commission firm which went bankrupt in the 1930s were turned over to the CEA for analysis. The study is restricted to results in grain futures (wheat, corn, oats, and rye) for a 9-year period, 1924 to 1932.

Futures market participants were divided into two broad classifications—hedgers and speculators. Three broad groups were distinguished among the speculators: scalpers, who were defined as buying and selling on small fluctuations in prices and closing the day with near even positions; spreaders, who were long and short on positions of equal amounts; other speculators, who represented all remaining traders. The Stewart study focused on the results of the last group:

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[1] Blair Stewart, *An Analysis of Speculative Trading in Grain Futures.* USDA Technical Bulletin 1001 (October 1949), p. 57.

	Profit Traders			*Loss Traders*		
Commodity	**Number**	**Total Net Profits**	**Average Profit Per Trader**	**Number**	**Total Net Losses**	**Average Loss Per Trader**
Wheat	2045	$1,508,407	$738	5496	$ 9,411,620	$1712
Corn	1525	$1,183,993	$776	2403	$ 2,222,602	$ 925
Oats	589	$ 124,038	$211	997	$ 772,132	$ 774
Rye	497	$ 293,042	$590	816	$ 825,838	$1012
All grains*	2184	$2,064,800	$945	6598	$11,958,200	$1812

* The "all grains" figures are not equal to the totals of the figures for the individual grains because some traders made profits in one or more grains but lost on their futures transactions in one or more of the other grains.

The overwhelming conclusion from the general summary is that the vast majority (75 percent) of the speculators (other than scalpers and spreaders) lost money. There were 6598 speculators in the sample with net losses compared with 2184 with net profits, or three times as many loss traders as profit traders. Net dollar speculator losses of approximately $12 million overwhelmed net dollar profits of nearly $2 million by six times. Speculators were not discriminating—they lost in every commodity, consistently and impressively.

The distribution of profits and losses indicated that for most traders the game was not played for high stakes. Eighty-four percent of the winners during the 9-year period won less than $1000. Stewart's sample of traders who held reportable positions did not indicate that large speculators were any more successful than small traders, although the sample was too small to warrant any such generalization.

Other significant points included the following:

1. Speculators showed a clear tendency to cut their profits short while letting their losses run.
2. The speculator is more likely to be long than short.
3. The entire period was one in which prices declined, and speculators suffered a disproportionate share of the total losses during the last 3 years, when the price decline accelerated.
4. No occupational group was able to claim results that differed from the general conclusion in regard to aggregate profits and losses. Managers in the grain business were somewhat more successful than other groups, yet they could produce aggregate profits in dollars that were only 28 percent of aggregate losses.

5. There was a clear tendency for long speculators to buy on days of price declines and for shorts to sell on price rises. This action indicates that traders were predominantly price-level rather than price-movement traders.
6. It cannot be known to what degree the trades for the sample were influenced by the brokerage firm at which all were made. The bankruptcy of that firm could, of course, have resulted from one factor or from a combination of many factors, but if one of these was the loss of its customers' capital resulting from its advice, the conclusions resulting from a study of the sample could be quite misleading.

The study also presented two case studies which isolated in detail the trades of the largest winner and loser. The loser traded virtually throughout the 9-year period, and his losses were more than $400,000 in wheat futures. In the spring of 1928 he had amassed a moderate profit, which he was to give back and follow with heavy losses resulting from a seasonal strategy, beginning in 1928, of buying wheat heavily at harvest time and selling it in the subsequent spring. The most successful trader struck quickly in 1924 by being long on corn, wheat, and rye, staying with his position until October of that year, and then fading away with profits of almost $300,000. He did not trade again during the 9-year period.

The Hieronymus Study[2]

Hieronymus was able to secure the summary records of closed trades for a commission house for the calendar year 1969. Even though conclusions derived from a 1-year inquiry must of necessity be tentative, it is instructive to compare recent results, however selective, with Stewart's observations 35 years earlier. The aggregate results for three major metropolitan offices of the firm are as follows:

Number of accounts	462
Number of accounts with profits	164
Total profits (dollars)	$462,413
Profit per account (dollars)	$2,819

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[2] Thomas A. Hieronymus, *Economics of Futures Trading* (New York: Commodity Research Bureau, 1977), pp. 259–263.

Number of accounts with losses	298
Total losses (dollars)	$1,127,355
Loss per account (dollars)	$3,783
Average result (loss) (dollars)	$1,439
Net loss, all accounts (dollars)	$664,942
Commissions paid (dollars)	$406,344
Put to clearinghouse (dollars)	$258,598

Thirty-five percent of the firm's customers (versus 25 percent in the Stewart study) closed 1969 with a profit. A total of $1,589,768 changing hands between winners and losers and involving 462 people is an *average* of $3441, and so the game cannot qualify as one representing staggering sums. This is confirmed by a frequency distribution, which indicates that half the winners and losers won or lost less than $1000 and that 84 percent won or lost less than $5000. Except for a few big losers (16 over $15,000) and fewer big winners (6 over $15,000), the clients of the commission house tended to pass money back and forth, paying commissions in the shuffle. It is interesting to note that a large number (170) of accounts were traded only once or a few times at most. This group, although constituting 37 percent of the total number of accounts, contributed 64 percent of the total losses. Regular traders (those who won or lost at least $500 and contributed $250 in commissions during the year) did better as a group, and their net profits were nearly enough to offset their net losses. Regular traders (42 percent) paid $364,647 of the total $406,344 in commissions, or almost 90 percent, which strongly suggests that the regular traders relieved the one-time traders of their money and then deposited it with the firm in the form of commissions.

The Houthakker Study[3]

The conclusions of Houthakker's early studies were consistent with the conclusions of later work by others done in greater detail and with more statistical evidence. Small traders tended to prefer the long side of the market to a considerable degree. They also apparently had less forecasting ability than did large speculators.

These studies were limited to only wheat, corn, and cotton and covered only three periods. Wheat and corn were observed from 1937 to 1940

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[3] Hendrik Houthakker, "Can Speculators Forecast Prices?" *The Review of Economics and Statistics* (May 1957).

and from 1946 to 1952, whereas cotton observations covered the period 1937–1952. Elimination of the data for the war years (1941 to 1945) for the two grains might make a comparison of conclusions from these markets with conclusions from the cotton market questionable.

A major contribution of this work was the inspiration it provided for others to broaden and deepen the research into the questions it sought to answer.

The Rockwell Study[4]

The Rockwell study, based on Houthakker's earlier method of analysis, makes use of more than 7900 semimonthly observations covering 25 CEA-regulated markets for 18 years, beginning in 1947, as described in Table 11-1. The study does not include the markets such as pork bellies, cocoa, and sugar, which at that time were unregulated and which constitute a significant percentage of futures trading in more recent periods. Three different market aggregations were used: "All Markets," covering 25 markets; "Large Markets," including only Chicago wheat, New York cotton, and soybeans; and "Small Markets," which included the remaining 22 markets. A reasonably stable general price level occurred from the beginning of the period to the end, as shown in Table 11-1.

For the 18-year period in all markets there is a positive total return of about $750 million on the long open interest, as illustrated in Table 11-2. About 40 percent of the return to the long open interest goes to the small speculator, and the remainder is divided fairly equally among the large speculator, the hedger, and the spreader.

If, in all markets, those holding long positions account for about $750 million in profits, there must be an offsetting $750 million loss to those holding short positions. Again the small speculator bears approximately 40 percent of this loss.

The large speculator again makes a profit, albeit a small one ($25 million) when compared with gains on the long side. It is important to note that the large speculators are the *only* group that has an aggregate profit on

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[4] Charles Rockwell, "Normal Backwardation, Forecasting, and the Returns to Commodity Futures Traders," *Proceedings of a Symposium on Price Effects of Speculation in Organized Commodity Markets, Food Research Institute Studies,* Supplement, 7 (1967), 115. Portions of this study have been referred to in Chapters 2 and 4. Before proceeding, the trader should review the breakdown, in percentages, of the value of the open interest by participant in Table 2-2.

the short side for All Markets. The short hedger bears 40 percent of the short-side losses in All Markets, about equal to those of the small speculator. The hedger, however, does not offset short losses with long profits because long-side gains account for only 20 percent of the long profits.

In the Small Markets small speculators lose money on their long positions. Their long losses are offset by large speculators and long hedgers, and so the total dollar return to those holding long positions in the Small Markets is virtually zero. On the short side only the large speculators make money and they achieve these profits mainly at the expense of the short hedgers.

In the Large Markets the small speculator makes almost 50 percent of the long-side profits. On the short side the large speculators make a little money, but the short hedgers lose more than twice the amount of their gains on the long side. The total return on the long open interest in the Large Markets ($751.4 million) contrasts markedly with the insignificant return on the long open interest in the Small Markets.

A summary follows of the significance of the net returns to each group for the 18-year period, as presented in the last three rows of Table 11-2. It should be noted that the profit flow in the three Large Markets determines to a great extent the behavior of the All Markets aggregate.

1. When the short-side losses of small traders are compared with their long-side profits, the group shows a small net loss for All Markets.
2. Large speculators win consistently (though unevenly) in Small and Large Markets, and their total winnings ($178.8 million) come almost entirely at the expense of hedgers in the Large Markets.
3. In the Small Markets hedgers do much better ($6.5 million) than they do in the Large Markets, and the profits of the large speculator ($61 million) are made at the expense of the small speculator.
4. The losses of hedgers in the three Large Markets provide the profits for large speculators and almost enough profits for small speculators to offset their losses in the 23 Small Markets.

Even more instructive is the presentation in Table 11-3 of the annual profits in All Markets for all participants. The small speculators lose in 11 of the 18 years. Their average loss is $15.1 million and their average profit,

TABLE 11–1

Description of Data and Price Levels

	Period of Observation			Change in Price Level of Nearby Contract,† Dollars		Annual Percentage Price Change	
Commodity and Markets*	From	To	Number of Semi-monthly Observations	Start	End	From Start to End	Between Maturity Years
Wheat, Chicago Board of Trade	7/47	6/65	432	2.39375	1.42250	–2.3	–2.2
Wheat, Kansas City Board of Trade	7/50	6/65	360	2.30375	1.43500	–2.3	–1.6
Wheat, Minneapolis Grain Exchange	7/50	6/65	360	2.36125	1.59750	–2.2	–2.5
Corn, Chicago Board of Trade	7/47	6/65	432	2.30375	1.32250	–2.2	+1.4
Oats, Chicago Board of Trade	7/47	6/65	432	1.02000	0.67750	–1.9	–5.1
Rye, Chicago Board of Trade	7/47	6/65	432	2.52000	1.15750	–3.0	–1.6
Soybeans, Chicago Board of Trade	7/47	6/65	432	2.78000	2.96000	+0.36	–0.7
Soybean meal,‡ Chicago Board of Trade	7/47	6/65	432	87.50	71.10	–1.0	–12.0
Soybean oil,§ Chicago Board of Trade	7/50	6/65	360	0.1245	0.1008	–1.3	–3.1
Cotton, New York Exchange	7/47	6/64	408	0.3898	0.3328	–0.9	–2.8
Cotton, New Orleans Cotton Exchange	7/50	6/60	240	0.3569	0.3278	–0.8	–4.3
Cottonseed meal, Memphis Merchants Exchange Clearing Association	7/47	6/60	312	79.90	54.00	–2.5	–9.4
Cottonseed oil, New York Produce Exchange	7/47	6/65	432	0.2350	0.1232	–2.6	–0.6
Lard, Chicago Board of Trade	7/47	6/62	360	0.1960	0.0870	–3.7	–1.6
Flaxseed, Minneapolis Grain Exchange	7/50	6/62	288	3.7150	3.1900	–1.2	+2.0
Shell eggs, Chicago Mercantile Exchange	7/47	6/65	432	0.5262	0.3490	–1.9	–0.1

TABLE 11–1 (*Continued*)

Frozen eggs; Chicago Mercantile Exchange	7/61	6/65	96	0.2635	0.2687	+0.5	–4.6
Potatoes, New York Mercantile Exchange	7/47	6/65	432	2.96	2.58	–0.7	+5.0
Wool tops, Wool Association of the New York Cotton Exchange	7/47	6/62	360	1.570	1.666	+0.4	–4.7
Grease wool, Wool Association of the New York Cotton Exchange	5/54	6/63	257	1.413	1.190	–1.7	–0.2
Bran, Kansas City Board of Trade	7/47	6/56	216	58.50	33.20	–4.8	–7.8
Shorts, Kansas City Board of Trade	7/47	6/56	216	60.00	38.90	–3.9	–9.8
Middlings, Kansas City Board of Trade	7/55	6/56	24	37.00	35.15	–5.0	–3.4
Onions, Chicago Mercantile Exchange	9/55	6/59	91	2.10	1.30	–9.5	–1.0
Butter, Chicago Mercantile Exchange	7/47	6/53	144	0.6775	0.6120	–1.6	–2.4

[*] "Large markets" are wheat at Chicago, cotton at New York, and soybeans.

[†] The nearby contract is the first contract that expires after the first observation; generally it is July.

[‡] Soybean meal is for the Memphis Merchants Exchange Association until July 1953.

[§] Soybean oil is for the New York Produce Exchange until July 1950.

Source: Rockwell, op. cit., 115.

TABLE 11-2

Aggregate Profits by Trading Groups: Long, Short, and Net (in millions of dollars)

	Large Markets		*Small Markets*		*All Markets**	
Trading Group	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
Small traders	369.7	–303.6	–68.1	–1.4	301.6	–305.0
Reporting speculators	114.8	3.1	38.8	22.2	153.5	25.3
Reporting spreaders†	159.0	–159.0	5.5	–3.4	164.5	–163.1
Reporting hedgers	108.1	–291.2	25.4	–18.8	133.5	–310.1
Total long open interest*	751.4		1.5		752.9	
Small traders, net	66.1		–69.5		–3.4	
Reporting speculators, net	117.8		61.0		178.8	
Reporting hedgers, net	–183.2		6.5		–176.6	

* Because of rounding, totals are not necessarily exact sums of the components shown.

† This category is included only for balance purposes. The sum of the net positions is not zero because of its omission.

Source: Rockwell, op. cit., 119.

$23.7 million. If the largest profit years are removed (1950–1951 and 1960–1961), the average profit drops to $10.5 million, well below the average loss. There is little consolation to the small speculators in the realization that 68 percent of their profits for the 18-year period may be attributed to only two years.

The large speculators, on the other hand, show a profit in 15 of the 18 years. Their average yearly profit is almost $13 million, even though they account for perhaps less than 2 percent of the total value of the open interest, whereas their average annual loss is only $3.4 million. If the two largest profit years are removed, the average profit is $9.6 million, still virtually three times the average loss of $3.4 million. The consistency of the profit-making capacity of the large speculators is impressive.

The hedgers, during the 18-year period, show a $6.5 million profit in the 22 Small Markets, yet their loss in the Large Markets is so large ($183.1 million) that they suffer an All Markets loss of $176.6 million. Research done by Working[5] is consistent with these findings. Working

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[5] Holbrook Working, "Tests of a Theory Concerning Floor Trading on Commodity Exchanges," *Proceedings of a Symposium on Price Effects of Speculation in Organized Commodity Markets, Food Research Institute Studies,* Supplement, 7 (1967), 5–48.

TABLE 11-3

Annual Profits for All Markets (in millions of dollars)

Year	Small Traders, Net	Large Speculators, Net	Hedgers, Net	Total
1947/48	16.2	19.5	–34.2	115.9
1948/49	–13.5	–0.5	13.8	–48.2
1949/50	7.9	17.0	–24.9	153.3
1950/51	47.5	28.9	–76.11	229.5
1951/52	–10.5	7.8	2.7	126.2
1952/53	–44.3	–4.3	46.4	–171.9
1953/54	12.8	16.3	–29.7	113.4
1954/55	–17.0	5.1	12.0	–27.7
1955/56	2.5	12.7	–15.5	73.9
1956/57	–6.4	6.5	–0.1	5.8
1957/58	–9.4	0.9	8.4	–27.4
1958/59	–3.6	1.4	2.5	–3.7
1959/60	–14.6	4.5	10.2	–38.3
1960/61	63.3	35.2	–98.6	217.8
1961/62	–19.4	–5.4	24.8	–95.9
1962/63	–3.6	2.1	1.6	50.5
1963/64	–24.1	10.0	14.1	–75.0
1964/65	13.0	21.2	–34.1	155.0
Total	–3.4	178.8	–176.6	752.9

Source: Rockwell, op. cit., 120.

indicated that the major proportion of hedging losses may spring from market execution costs, which can be considerably greater than the reduced member commissions paid by most large hedgers. Because hedgers' orders tend to be large, any buys and sells would tend to make price bulges and dips which scalpers would trade. Such action, if true, renders understandable why the amount of speculation in a given market is closely tied to the amount of hedging. Hedgers may be the major source of income of the large speculators. Because most hedging is short hedging, most large speculator profits should come from the long side of the Large Markets. This may be verified by referring to Table 11-2.

If the annual rates of return to the participants are defined as gross profits as a percentage of contract value, Table 11-4 can present the trader with an idea of the individual rates of return by trading groups. Even

TABLE 11-4

Aggregate Rates of Return by Trading Groups (percent)

Groups and Positions	Large Markets	Small Markets	All Markets
Total positions:			
All groups	6.1	0.0	4.0
Small traders, long	5.6	–2.0	3.0
Small traders, short	–5.8	–0.0	–4.1
Large speculators, long	10.1	4.3	7.6
Large speculators, short	0.5	5.0	2.7
Hedgers, long	5.3	1.7	3.8
Hedgers, short	–7.1	–0.6	–4.3
Net positions:			
Small traders, net	0.6	–1.2	–0.0
Large speculators, net	7.2	4.6	6.1
Hedgers, net	–3.0	0.1	–1.7

Source: Rockwell, op. cit., 122.

though commissions, taxes, and capital reserves are omitted, the fact that margin requirements are only 5 or 10 percent of the contract value means that the actual returns on margin money may be as much as 10 to 20 times the returns indicated here. Regardless of the level of absolute profits, the relative profits of the different trading groups may be compared.

For All Markets the rate of return on the long open interest is 4 percent annually. The hedgers make about this amount on net long positions, and so the large speculators pick up what the small traders lose on the long side in Small Markets as well as what the hedgers lose in the Large Markets. On the short side the large speculators win from the small traders and the hedgers in both Small and Large Markets. Again the large speculators are the standouts in the Large and Small Markets. Their overall return of 6.1 percent is earned because they do well in both their long and short positions and because the ratio of their long to their short positions is large during the periods when short hedgers are losing. The small traders lose so much on their short positions that the resulting profits on their long positions do not overcome the deficit. If the hedgers are offsetting existing or expected positions in the cash market, the overall loss (–1.7 percent) may provide an insight into the gross cost of placing a year-long hedge.

Until recently the risk premium concept, as developed in Chapter 4, was the consistent, if overworked, springboard into any discussion of the distribution of profits and losses in futures trading. The naive strategy (being net long when hedgers are net short and being net short when hedgers are net long) does not result in an acceptable explanation of the profit flow. The failure to isolate and measure persistent evidence that speculators are paid for merely playing the game implies that speculative profits must be explained by reference to the trader's forecasting ability. Forecasting ability, however, may be defined as two broadly differing skills. The first is the basic ability to be long in markets when prices are going up on the average and net short in markets when prices are going down on the average. This measure of forecasting skill indicates the long-run ability of a given trading group to stay on the "right" side of a given market and is referred to as "basic skill." On the other hand, a second level of forecasting ability is the "special skill" that a trading group exhibits when it makes profits from price movements that are shorter in duration than the total period under observation.

Table 11-5 presents a division of the rates of return according to basic and special skills. Small traders make important money only in the Large Markets, where rising prices result in a positive figure for basic skill (R^B). Small traders exhibit a consistent negative value for special skill (R^F). Large speculators, as is obvious by now, make money on the evidence of both skills. There are no "minus" values for the large traders in the Large Markets, Small Markets, or All Markets summary. Almost 80 percent of the total profit of the large traders comes from their special skill and only 20 percent from their basic skill. The large traders, then, are not rewarded chiefly by executing the strategy of buy and hold in an extended up move or sell and hold in an extended down move; instead, they are rewarded chiefly by trading price changes in the relative short run.

Working's study[6] of the detailed record of one professional trader in cotton futures for a brief period is important for several reasons. In his attempt to test the theory that most floor trading is scalping and that the execution costs of hedging are perhaps the chief source of income to speculators in futures markets, the definition of "scalping" was considerably enlarged to cover not only the smallest dips and bulges that occur but those that last up to a few days. In the large, well-traveled markets professional scalping tends to specialize, sometimes into three distinguishable classes—

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[6] Ibid.

TABLE 11–5

Division of Rates of Return According to Basic and Special Forecasting Skills by Net Trading Groups* (percent)

Trading and Skill Groups	Large Markets	Small Markets	All Markets
Small traders, net:			
Rate of return from special forecasting skill (R^F)	–0.1	–1.2	–0.4
Rate of return from basic forecasting skill (R^B)	0.7	0.0	0.4
Total rate of return (R^A)	0.6	–1.2	–0.0
Large speculators, net:			
Rate of return from special forecasting skill (R^F)	5.0	3.9	4.8
Rate of return from basic forecasting skill (R^B)	2.2	0.7	1.3
Total rate of return (R^A)	7.2	4.6	6.1
Hedgers, net:			
Rate of return from special forecasting skill (R^F)	–0.9	0.8	–0.6
Rate of return from basic forecasting skill (R^B)	–2.1	–0.7	–1.0
Total rate of return (R^A)	–3.0	0.1	–1.7

* The decomposition in a given market of the total actual rate of return (R^A) into basic forecasting skill (R^B) and special forecasting skill (R^F) is discussed in Rockwell, op. cit., 127.

Source: Rockwell, op. cit., 127.

unit-change scalpers, day-trading scalpers, and day-to-day scalpers. Unit-change scalpers, who stand ready to buy one tick below the last sale or sell one tick above it, almost invariably end the trading session in a zero net speculative position. Day traders tend to concentrate on dips and bulges of greater than unit size and may decide to hold some small percentage of their positions overnight. Day-to-day scalpers more often than not are prepared to carry most or all of their positions into the next trading session or for 2 or 3 successive days.

As indicated by the Stewart study, nearly all speculators, on or off the floor of the exchange, make some attempts at scalping. Price-level traders may wait for price dips before getting long or for price bulges before initiating a short position. These traders, of course, run the risk of missing the market completely in those trades that, by definition, are the most successful. An alternative is to place orders "at the market," which ensures some execution costs at the hands of floor traders who are, themselves, scalping. The small trader is not on the exchange floor and cannot easily, for example, buy "on a dip" while the dip is forming.

Because the professional scalper derives profits from trading dips and bulges of varying time lengths, it seems difficult to understand why the ability to recognize price trends is asserted by floor traders to be the most important requirement for successful scalping.[7] The adage "Cut your losses and let your profits run," heard by every trader alive, including those who came down with the last rain, has always been regarded as a basic rule of successful trading. Yet the effort to comply with the directive is successful only for the trader who can consistently anticipate the continuation of price trends. Such success is highly doubtful for reasons considered at length in Chapters 4 and 7. How, then, can the concepts of scalping and trend following coexist?

Working's thoughts, following a study of a 2-month record of floor trading by a professional trader, explain why the adage "Cut your losses and let your profits run" combines in one statement two entirely different approaches that are important for different reasons:

> (a) because a "trend" is the converse of a dip or bulge, trend recognition is a means of recognizing dips and bulges; (b) a scalper recognizes, in order to partially offset the losses that he incurs from trends whose beginnings he mistakenly regards as initial moves in a dip or bulge; and (c) the adage, "cut your losses and let your profits run," which is highly respected by floor traders, deserves such respect even if its application cannot be made a source of net gains. By letting profits run, to the best of his ability, a scalper derives such profits as he can from the emergence of unpredictable trends that happen to be in his favor, partially offsetting inevitable losses from the emergence of trends that run against him. By setting a limit on the amount of loss that he allows himself to incur, per unit of the commodity, a scalper accepts unnecessary loss to a greater extent than he avoids further loss (a consequence of the supposition that brief price trends are a source of net loss); but the practice, while slightly reducing his overall rate of profit per unit of the commodity, allows him to trade safely on a scale several times as large as would be prudent if he did not thus limit his losses per unit . . . effort to deal as successfully as possible with brief price trends is necessarily an integral

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[7] Ibid., 44.

part of professional scalping; and therefore, evidence that a floor trader makes such efforts does not, by itself, warrant classing him as a trend trader.[8]

The Ross Study[9]

In a study of 2637 customers chosen at random from among the customers of a large brokerage firm during 1970 and 1971, Ross provided no more comfort than his predecessor researchers for speculators looking for an easy way to acquire great riches. The total losses after commissions of the sample group exceeded the total profits of the winners by more than double. The losing group actually showed net profits of $2.6 million before commissions but was overwhelmed by total commissions approximating $8 million.

What results might have been obtained in today's markets where discounts are available is a matter of conjecture. The general level of commissions is higher, so the discounted commissions might not differ much from the undiscounted levels of 1970. Another factor which, as usual, is difficult to evaluate is the effect of the advice given to the traders by the brokerage firm at which they were trading.

The Hartzmark and Leuthold Studies

Hartzmark,[10] using 9 years of data from the CFTC, sought to determine if trading profitability was dictated by skill or luck. He separated market participants into two groups: commercial traders, who trade to hedge price risk (i.e., cattle owners, farmers, etc.), and large speculators, who trade only for potential profit. Two different types of forecasting ability were examined. The first type, *consistent ability,* measured the ability of traders to predict the direction of futures prices over long periods. A trader with this skill would more often than not establish a long (short) position prior to an increase (decrease) in the futures price. The other type of forecasting skill is called *big hit ability.* Traders with this skill are able to predict both the magnitude and the direction of futures prices and will thus establish their largest positions when the highest returns (largest price movements) are anticipated. The analysis considered seven futures markets from July 1,

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[8] Ibid., 45.

[9] Ray L. Ross, "Financial Consequences of Trading Commodity Futures Contracts," *Illinois Agricultural Economics,* **15,** No. 2 (July 1975).

[10] Michael L. Hartzmark, "Luck versus Forecast Ability: Determinants of Trader Performance in Futures Markets," *Journal of Business* **64** (1991) no. 1, 49–73.

1977 to December 31, 1981. The markets included oats, wheat, pork bellies, live cattle, feeder cattle, Treasury bonds, and 90-day Treasury bills.

Hartzmark found that neither group of traders could consistently forecast the direction of futures markets.[11] Thus, large noncommercial (speculative) traders could not be considered an elite subset of successful survivors in the market; rather, their skills in predicting market direction varied widely. Hartzmark did find some weak support for the skill hypothesis when observing the results of a very few superior outliers with consistent forecasting ability. However, without observing the underlying characteristics of this elite group, it was impossible to determine if skill conclusively played a part in determining performance. The hedgers seemed to have slightly more consistent ability, especially in the pork bellies market, but taken as a whole the results were not impressive.

The test for big hit ability yielded similar results. Noncommercial traders' skill was nonuniform, with an overall negative bias. Hedgers again showed more consistency and in the oats market demonstrated a marked ability to take larger positions before big price moves. However, given the rather bleak overall performance of both, Hartzmark concluded that trading results were a function of luck, not skill.

Leuthold, Garcia, and Lu,[12] intrigued by Hartzmark's results, studied 9 years of CFTC data in the pork bellies market. They found that all reporting traders generated significant profits during the time period examined and that the distribution of returns over time was not random. For the elite subset of the largest traders examined, significant profits were positively related to the traders' ability to forecast price behavior. Speculator returns were the most impressive, with that group exhibiting both *consistent* and *big hit* ability. The question of whether this type of ability is evident exclusively in the pork bellies market remains to be determined.

The Gilbert and Brunetti Study[13]

Gilbert and Brunetti's study examined coffee prices from 1993 to 1996, a period of considerable market volatility. There were several reasons for the

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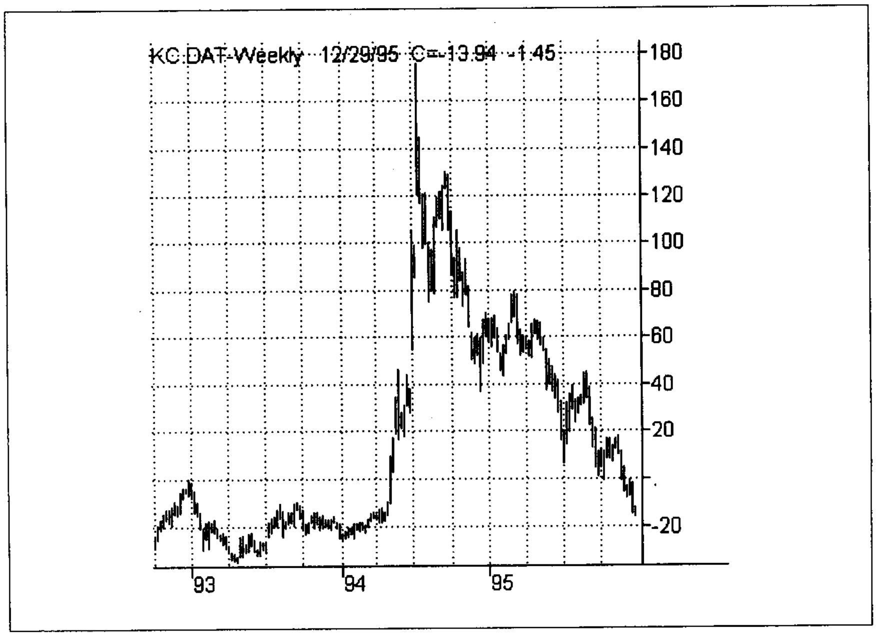
[11] This result is in stark contrast to earlier studies which found that large speculators and hedgers typically profit or break even, whereas small speculators consistently lose money.

[12] Raymond M. Leuthold, Philip Garcia, and Richard Lu, "The Returns and Forecasting Ability of Large Traders in the Frozen Pork Bellies Futures Market," *Journal of Business* **67** (1994), no. 3, 459–473.

[13] Christopher L. Gilbert, and Celso Brunetti, "Speculation, Hedging, and Volatility in the Coffee Market, 1993–1996." Queen Mary and Westfield College, University of London, 1997.

FIGURE 11–1

The coffee futures market, 1993–1995. Chart created using TradeStation 4.0 by Omega Research, Inc.



price movement evident in Figure 11-1. The first was the breakdown of the International Coffee Organization (ICO) in 1993, which might have caused prices to rise in late 1993 and early 1994.[14] The other contributing factors were the two frosts during the 1994 Brazilian winter, which caused extensive damage to the coffee crop and sharply higher prices in mid-1994. The researchers used CFTC data to determine the effects of the increased volatility on the profitability of speculators and hedgers. Their study yielded the following:

1. During 1993, when the coffee market experienced low volatility and little directional price movement, there was no general tendency for any group of traders (speculators or hedgers) to make profits at the expense of any other group.

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[14] It is not possible to determine exactly how the coffee retention scheme affected futures prices.

2. During the second and third quarters of 1994, when the bulk of the price increase was realized, speculations were extremely profitable. Hedger losses during this time were estimated at approximately $1 billion. Both large and small speculators made profits.
3. In 1995, when coffee prices fell, hedgers profited over speculators.
4. The total gains and losses during this period are as follows: large speculators, profit of $436 million; small speculators, profit of $180 million; hedgers, loss of $557 million.

It is interesting to note that during a period of high volatility and during a strong uptrend in prices, speculators were successful in realizing substantial gains from the coffee market. However, when the trend reversed, speculators tended to stay long and suffered losses. Losses were also evident in the early period, in which there was no clear price trend.

Additional Evidence

The authors have been able to confirm that the average expectation of a trader making net profits in any given year will be one in four. The records of one respected brokerage firm indicated that for 10 years, beginning in 1962, the percentage of traders concluding the year with net profits ranged from a low of 14 percent to a high of 42 percent, with an average of 26 percent. In 1969, 23 percent of the accounts made money, compared with 35 percent in the Hieronymus sample of 462, which was approximately 10 percent of the size of the firm the authors examined. At any rate, the three estimates do not seem to be mutually exclusive in their implications for any given year. As the rates of return for the CFTC trader classifications are examined, however, it will be seen that there is a significant difference between making profits in any *one* year and making *consistent* profits over a period of many years.

SKILLS OF THE TRADER

Forecasting Skills

The bald, unyielding fact is that small traders, as a group, seemingly possess no basic forecasting or special forecasting skill. They hold 46 percent of the value of all contracts and their gross profits are zero. Substantial losses occur when commissions are included. On the average, then, a small trader has the expectation of losing money—the losses over a reasonable period to equal commissions. It is evident that small traders do not require a history of profits to continue trading. The explanation of such a phenomenon may take several directions. First, the needs of some small traders may be met by merely playing the game. Having something that is dynamic and fast-paced to get up for in the morning is so exciting that the trader may be more than willing to risk losing money for the privilege of speculating. Second, traders may continue to trade because they believe they can forecast prices. The fact that they cannot consistently do so does not deter them because they tend to remember profits and forget losses. Third, the small trader may continue to trade because his or her group is amorphous and consists not of a crowd but of a parade. The successful small trader becomes large as a result of competence, whereas the unsuccessful small trader is eventually forced to withdraw from the market and is replaced by new blood. Fourth, small traders may be convinced that their latest mistake is also their last mistake and that, having learned, there is nothing ahead but smooth sea and blue sky.

On the other hand, small traders have years in which they post impressive profits. Referring to Table 11-3, it may be seen that in the years 1950–1951 and 1960–1961, for example, small traders show returns four and six times larger, respectively, than the average profit of the five other profitable years. This performance may well be explained by the tendency of small traders to rely on the existence of positive serial correlation as the basis for their trading strategy; that is, small traders tend to rely on long-run, trend-following methods for profits, in which they assume that the tendency of a rising market is to continue to rise and the tendency of a falling market is to continue to fall. Such trading theories result in trading strategies of buying strength and selling weakness, which may enable the small trader to reap extremely high profits in years when such trends are of long duration. Unfortunately, in the long run, more markets are trading markets than long-trending markets; that is, there seems to be more of a tendency for price reversal than for price continuation.

Large traders generally tend to view markets as trading markets rather than trending markets. They may rely more heavily on the presence of negative serial correlation; therefore, they may tend to sell certain rallies and buy certain declines. Such a result is consistent with an examination of the returns of large traders in such big profit years as 1950–1951 and 1960–1961. In those years large traders show a return, respectively, of

3 and 3.7 times the average profit of the other 13 profitable years, considerably lower than those for the small trader.

It should be emphasized that there is a considerable difference between a winner in any given year and a consistent winner over a significant period of time. Although the studies to date have indicated that a trader in any given year has an approximate probability of one in four of achieving a net profit, the probability of extending his or her supremacy consecutively drops precipitously. Of the 25 percent who win in any given year, only 2 percent manage their skills in a consistent manner that ensures their reappearance in a ratio approaching 15 of 18. For the remaining 23 percent *sic transit gloria.*

It is important to note that the dismal profitability of the small traders results in no small part from their inability to manage money intelligently. Of the four elements of money management, the two discussed in detail in Chapter 11 are probably the chief culprits—the expectation of the game being played and the probability of ruin. The small traders seldom approach the expectation of the game in the spirit of fair, good, and bad bets as determined by the profitability of the event occurring, the ratio of gain to loss, and the cost of playing the game. In their desire to play a speculative game to the hilt, in which results, either good or bad, occur quickly, they do not give the probability of ruin the cool reflection it deserves, and the small speculators remain generally unconvinced that they cannot change the mathematical expectation of the game by the way they play the game.

There are quantitative and qualitative reasons for the supremacy of one trader over another. Many of the quantitative skills, which certainly may be acquired through patience and intellectual diligence, have been the subject of much of this book. Many of the skills that must be developed, however, deal with behavior and the reaction of the trader to ongoing events and conditions.

Behavioral Skills

It is difficult to discuss the development of skills that cannot be internalized adequately except by experience. The fact that such behavioral skills exist is clearly illustrated by a neophyte who, having been sensitized to a particular behavioral skill, may say, "Why didn't you tell me that before?"—to which the professional trader replies, "I did." People make markets. The nature and behavior of people, although not reducible to a formula, is at least agreeable to analysis. The behavior of the trader should move toward the kind of behavior necessary for survival.

Few studies since World War II have dealt specifically with the behavior of traders. One, by Blair Stewart, has been examined. Another, by Ira Glick, deals with the professional trader. Others have made limited attempts to analyze the characteristics of the amateur speculator.

Glick's study[15] analyzed three styles of trading that professional traders on the Chicago Mercantile Exchange believed could lead to success:

> One successful pattern is exemplified by the scalper, and, from the trader's point of view, is probably the most difficult to realize. The typical scalper is thought of as young, relatively new in the occupation; flexible, aggressive and exhibitionistic in his behavior, and *always* minimizing losses.
>
> A second career pattern for success is the older, more mature trader, actively and in a large way engaged in some phase of the egg business. He has excellent sources of information and is regarded as intelligent, able to view and grasp the total market situation in terms of a span of time and a diversity of factors. He is thought of as being wealthy and as having many wealthy friends, probably some of whom are also in the cash egg business.
>
> A third successful career line is quite similar to the above type, but this type of successful trader does not often appear on the exchange floor. Instead, he is thought of as purposely staying away from the (physical) marketplace, developing his trading strategy and tactics on the basis of good sources of objective information and executing his purchases and sales through representatives on the trading floor. . . .[16]

Narrow studies made by the authors and others do not provide much information that is not readily observable to practitioners in the futures industry. Speculators tend to classify themselves either as fundamentalists or as technicians, with most preferring the latter. Technicians, most of whom rely wholly or primarily on charts, generally conclude that market patterns are the same in all or most markets and, hence, tend to trade in more different markets than fundamentalists.

Most such traders rely for information primarily upon their brokers, general financial publications, services, and newsletters. Few engage in any individual research of any depth. Most lose, but feel that they are learning how to avoid losing in the future, and so they continue to trade. Many

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[15] Ira O. Glick, "A Social Psychological Study of Futures Trading," an unpublished Ph.D. dissertation (Department of Sociology, University of Chicago, 1957).

[16] Ibid., pp. 245–246.

seem to continue trading and losing in the same manner as before, apparently blaming unusual conditions or bad luck for their lack of success.

Although much information is contained in these studies, they do not really contain a systematic insight into the behavior of the futures trader. A systematic approach would serve not only to explain the trader's present behavior but also to outline useful paths for change in the future. Perhaps one day a psychologist with an understanding of speculators' behavior will explain why traders continue to rationalize methods that have not worked, follow advisers who have rarely been right, fail to follow their own plans, and otherwise refuse to confront reality.

It appears that the ability of traders to confront reality may well have much to do with their eventual success. Such traders are able to adapt to various market and trading conditions. If their plans include the use of stop-loss orders, they place such orders, and having placed them, they do not find excuses to cancel them. Such traders do not get so carried away with greed or so cowed by fear that they are unable to act rationally.

Unsuccessful traders cope with unpleasant reality in quite a different way. They depend not upon changing themselves or their methods but rather on fantasizing or changing the ways they view reality. They tend to be selectively perceptive and retentive; that is, they tend to see and remember what fits their needs and expectations. They prefer simple, easily constructed mechanical systems which tend to have dollar results approaching 50 percent profits and 50 percent losses. When commissions and execution costs are subtracted, the normal expected path of such traders' capital is a gentle downward slope that terminates considerably short of their capacities for self-deception.

Such traders tend to devise new filters after each series of trades that might have eliminated losses and converted them into profits. They also explain away a loss or two by blaming them upon unusual news items or especially disruptive untimely reports. They conclude, therefore, that their 50-50 results really sprang from a system destined to yield 70-30 or 80-20 in the long run. The long run, however, never seems to arrive. The capacity of such people to misinterpret reality appears to be limitless.

No matter how successful traders become, they still find it difficult to live in the real world. Where members of the animal kingdom must adjust to the external environment on its terms, human beings can manipulate reality over a broad range by the use of symbolism. Traders must realize that desirable qualities can be bestowed by words alone and that such words can be affixed more readily to the occasion than the occasion can be modified to fit the actual meaning of the words. Traders do not enjoy being wrong. Besides ruining their credit balance, being wrong does not build a good image of the self. Yet mistakes must be constantly perceived and remembered if for no other reason than that under no other conditions can they be controlled.

Successful trading is reached, if at all, by following a series of successive approximations. Early in the process ignorance is the rule, and traders know that they know nothing. Following a sometimes long apprenticeship in which the vocabulary symbols are acquired, a false sense of competence spreads like a thin veneer and serves to entertain friends with the glibness of skills not yet acquired, though seeming to be. Given enough time, patience, and perseverance, successful traders enter into that third state in which they believe that they know something and no more. In this state they are "inner-directed" and not "other-directed."[17] The "other-directed" individuals react to what others believe about them. Their roles and values tend to be derived from what their peers expect of them. The "inner-directed" individuals hold to the thoughtful courses they set for themselves. Instead of being solely radar-equipped, as in "other direction," the "inner-directed" individuals rely on a gyroscope that is not at the mercy of whim or caprice. The successful traders' gyroscopes are finely tuned. They realize that without a thoughtful approach to trading they face the same problem that the German High Command faced in World War II, in which the invasion of Britain was planned but never executed, whereas the Battle of Britain was executed but never planned. Many traders never move beyond the point of development where they tend to execute trades that are never planned or plan trades that are never executed.

Traders must understand that decisions with favorable consequences evolve into a viable approach to trading only if they are consciously reduced to principles and followed with *great effort.* Traders who buy or sell on impulse find sooner or later that mere feelings about trading are 50-50; that is, there is no significant statistical correlation between good feelings and profitable trades. Therefore, to avoid the results of emotional activity, successful traders must be prepared to give up in trading what they find most rewarding in interpersonal relationships—good feelings. The propensity for traders to resist such depersonalization is high, and there is a constant temptation to spill out over the boundaries of the well-defined role of trading. Good feelings will come as a result of the successful plans that have been

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[17] David Riesman, *The Lonely Crowd* (New Haven, Conn: Yale University Press, 1950).

conceived and executed by a meticulous, thoughtful trader. Traders who share their thoughts about their trading philosophy with their brokers can do much to relieve stress between the two. This, in turn, might also influence trading results by achieving the benefits yielded by team play.

NOTES FROM A TRADER

The problems to which traders have set their faces have developed because their aspirations are infinitely expansible; the solutions lie in the hope that their knowledge and behavior are infinitely perfectible. In between the recognition of the problems and the acquisition of the quantitative and qualitative skills needed for their solutions lies a series of searches that must, many times, include the experience of failure. Indeed, no successful traders the authors have known can follow their paths backward very far without running into failure. It is not the act of failure, however, that differentiates the ultimately successful or unsuccessful traders. Rather, it is that the successful traders get up, spend a few days healing, reaffirm what they know, and go about the business of adding to their store of wisdom. In such a growth process the quality of persistence looms large and is virtually irreplaceable.

In the high-risk areas of the world of finance, the cold facts of probabilities cannot be changed by wishful thinking or by bemoaning the cruel realities of life. Some people win frequently and accumulate large sums. Others are destined to lose frequently and, at least as a group, lose the large sums that are won by the smaller group of winners. The chance of success may be helped by thinking straight, negotiating low execution costs, dealing with a broker who observes high standards of performance, and setting reasonable goals. Regardless of their intellectual capacity and the strength of their personal discipline, however, most players in the futures game are destined to lose to the few. Those who cannot accept this truism are well advised to turn their attention elsewhere.

The person involved responsibly, both intellectually and behaviorally, with the experience of trading may, to paraphrase Theodore Roosevelt, know at his best the triumph of high achievement, but if he fails, he will have failed while daring greatly, and so his place will never be with those timid souls who know neither victory nor defeat. Perhaps, then, in the final analysis, it may be as rewarding to travel as it is to arrive.

PART FOUR

THE BROKER IN THE GAME

There are at least two reasons for the inclusion of Chapter 12, "Building, Maintaining, and Servicing a Futures Clientele." The first is the obvious one of providing the futures broker with a guide to ongoing activities which show no clear beginning or ending. In that sense the chapter will have served its purpose if it proves useful as a yardstick for measuring the broker's individual performance. The second reason, however, is as important as the first. The chapter should be studied by traders so that as clients they may be aware of the principles on which the performance of a knowledgeable broker is based. The setting of standards does two things: first, both broker and client will more readily recognize substandard performance because good performance is defined; second, avenues to better performance are explored by which improvement in the quality of services rendered may be effected as much by client awareness as by the broker's presentation.

Chapter 13, "Compliance: I'll See You in Court," describes how brokers can avoid legal problems that will be costly, take up valuable time, affect their reputation, and perhaps result in something even worse.

12 CHAPTER

Building, Maintaining, and Servicing a Futures Clientele

"To profit from good advice requires more wisdom than to give it."

INTRODUCTION

Registered commodity representatives (known as *associated persons,* APs, or more commonly, *futures brokers*) are basically salespeople. They must build their clientele by using effective prospecting methods, maintain it by replacing lost customers, and service existing clients efficiently. It is a truly rare person who has enough skill and knowledge to perform capably as a sales representative and as a researcher at the same time. Both research and sales are full-time jobs for most people if done competently. The function of the AP is to locate potential clients who, because they are served honestly and well, will remain clients over time.

BUILDING A FUTURES CLIENTELE

Sales Personality

The impression made by APs on their clients is based on attitude, appearance, and ability to communicate. The attitude that all sales representatives should have is obviously beyond dispute. They should believe that their products are good for all concerned: their clients, their firms, and themselves. The clients' interests must come first, but the firm and its salespeople should also gain from satisfactory service. Long-term success is virtually impossible if all do not benefit adequately and fairly. The brokerage company must make a profit from its business, the sales representatives must be able to earn adequate livings handling their accounts, and customers must be financially or psychically rewarded to justify their trading. Some salespeople believe that no client ever profits in the long run. Others are so disturbed by the high percentage of traders who lost money that they are unable to function effectively. Such salespeople would help all concerned, including themselves, by selling some other product or by making a living in some other way. If the sales representative can accept the fact that trading futures is right for some people and wrong for others and tell all of them the truth about the business, assuming that they are interested in such knowledge, then enough sincerity can be shown to permit effective selling. If people are induced to trade who clearly should not trade, or if others are persuaded not to trade who might enjoy trading, profit from it, or both, or if a salesperson pretends to know what is not known, no one is helped. The proper attitude for most good sales representatives is derived in large part from the enthusiasm that comes from a real understanding of what they are selling and what motivates the people who are buying.

Sales representatives' appearances are dictated by the same standards that apply to anyone else in the investment field. They should look successful enough to avoid having their customers wonder why they are offering financial advice when they look like failures themselves. They should not, however, dress so extravagantly that they give the impression that they have acquired all the money that their clients have lost. Extremes of dress are almost certain to prove offensive to some people, who may respond by patronizing someone else.

Sales representatives communicate with their customers personally or by telephone or by mail. They must know how to speak, write, and spell. If their speech, vocabularies, or writing abilities are inadequate, they should recognize the deficiencies and do something about them beyond hoping that an office stenographer will note and correct errors. Effective formal courses in speech are available, and most communities have clubs dedicated to the improvement of public speaking. Group prospecting, such as addressing a luncheon meeting of a civic club, is too effective a sales device not to be utilized merely because a sales representative is too inexperienced or shy to learn to speak well. Vocabulary and spelling may also be improved by taking positive steps that can be fun as well as economically rewarding. Formal courses in letter writing are part of the program of virtually all business schools.

Industry Knowledge

Knowledge of the futures industry is a key ingredient in the development of an AP, and a lack in this area will most limit the quality of a broker's client base. No amount of marketing or sales "campaigning" will detract from an AP's obvious lack of product knowledge. As each successive level of competence is achieved, APs can pursue clients of increasing sophistication. It is these more affluent clients that will provide a solid base for a successful brokerage career. There are three types of futures traders; each type has its own set of needs and requirements from the brokerage representative. *Small speculators* (or retail traders) are by far the largest contingency of traders. There are approximately 200,000 active speculative accounts in the United States, and they hold a combined 46 percent of all futures contracts. The bulk of these accounts trade only a few times per year, and a huge percentage lose money consistently, by either using ineffective money management strategies or lacking forecasting ability. However, it has been shown[1] that many of these traders participate in the markets for reasons other than profit potential. Many of them trade for the excitement of the futures game; the amount of profit or loss is a secondary consideration. Regardless of motive, small speculators need APs that are aware of the rules, regulations, customs, and mechanical procedures of the exchanges and general knowledge of the legal, accounting, and tax aspects of trading. Successful reps do not allow their clients to overtrade, and reps do not encourage more risk in a market than their clients can afford to take. If the client insists on following the recommendations of a newsletter or other form of advice, the broker should perform know enough about the source of such information to be comfortable.

Note that a significant majority of those who dispense trading advice have long-term track records no more impressive than those of their client base. It is largely dependent on the AP to sort through the rubbish to find

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[1] W. B. Canoles, S. R. Thompson, S. H. Irwin, and V. G. France, "An Analysis of the Profiles and Motivations of Habitual Commodity Speculators, OFOR Paper Number 97-01 (May 1997).

the few "experts" who have opinions worth listening to. One of the most important words to learn in the area of product knowledge is "validation." Half-truths and unsupported opinions such as "Gaps on the chart must be closed" or "When a 3-day moving average line crosses a 10-day moving average line, a trading opportunity is evident" should not be inflicted on unsophisticated clients, who will as a result almost certainly lose their trading capital. Suggestions concerning areas of "support" and "resistance" that are based upon casual observation of dog-eared charts are probably useless, even if the suggestions are made by sincere representatives of brokerage firms appearing on television or at a client seminar.

Brokers who induce their clients to make decisions built on such fragile foundations will soon lose both their clientele and reputation. The same applies to those who give thoughtless advice in the area of money management. One of the most popular of these high-sounding concepts relates to reward-to-risk ratios. For example, if a trader is to risk 4 cents on a corn trade, with the objective of 8 cents' profit, one cannot say that the trade is a favorable 2:1 bet (the analysis does not consider the *odds* of either outcome).

The one area in which nearly all APs expect more than their firms can deliver is that of providing consistently successful, specific trading recommendations. The life of a futures broker would indeed be easy if all she or he had to do was distribute the recommendations of the firm's research departments to clients, who would then make significant profits in a short period. Telling clients the glad news of their latest gains is among the most pleasant of experiences APs can have, whereas breaking the news of yet another catastrophic loss is among the worst. Unfortunately, the most rational of brokers have yet to realize that customers who follow a firm's recommendations over time and lose money and are likely to blame the broker for their losses. However, if clients do make money, they will most likely credit their own ability to select trades wisely.

An important step toward professionalism is becoming familiar with the old and new literature in the industry. In addition to the obvious sources of current information (financial magazines, newspaper, and the Internet) is the scholarly work done in futures and the related areas of probability, risk management, and efficient portfolio construction. A collection of books on these subjects can be acquired for a reasonable price from a number of financial book companies. An awareness of the current and previous research in the area of futures trading will prevent many common mistakes from being repeated in the future.

Hedgers are a more complex group. Since a bona-fide hedger is interested primarily in reducing the market risk of his or her business (i.e., a food company protecting against an increase in grain prices), a hedger is typically active in only a few markets. The requirements for an AP under these circumstances are much more rigorous. For example, a beef processor would require that the broker know all requisite fundamentals of the cattle market, including the most likely direction of feed prices, the approximate number of cattle in feedlots, and the impact of adverse weather conditions in the Midwest. Although hedge accounts are more maintenance-intensive, they trade more frequently and last much longer than the average small account, thus making them quite valuable. Consequently, the most successful APs can be found attending industry gatherings and writing for publications that cater to the needs of such active hedgers as farmers, grain elevator operators, cattle owners, pork producers, and mortgage insurance firms.

Large speculators (speculators whose position size requires them to report their holdings to the CFTC) are the most desirable clients for the registered commodity representative. This elite group trades frequently, and the size of each trade is much larger than would be expected from a hedge or retail account. Large speculators also have a greater chance of consistently winning the futures game, with their longevity adding to their value to the AP. Unfortunately, these traders are much more sensitive than their counterparts to the commissions charged to their accounts (which probably helps to explain their increased survival). It is not uncommon for large traders to pay as little as $7 per round turn, as opposed to the $10 to $40 charged to retail traders and hedgers. Most APs who specialize in this type of business provide 24-hour coverage to their clientele as well as up-to-the minute account information and other services. It is at this level of business that the brokerage firm's financial stability becomes a factor. It is also important to the large speculator that the firms with which they transact business are full members of all exchanges and have sufficient floor operations that they can "disguise" their orders to prevent others from "piggybacking" on their trades.

Prospect Knowledge

Identification of potential futures clients is difficult except in a most general way. Many surveys have been conducted by financial publications and futures exchanges. The Chicago Board of Trade surveyed 60 of its member firms and published a summary of the responses in *A Profile of the U.S.*

Futures Market in October 1983. Over half of the traders were over 50 years old, and over two-thirds were college graduates, of whom about half held advanced degrees. Most had incomes well beyond the national average. The largest groups classed by occupation were farmers and engineers. Over half the traders were self-employed. Most traders (96 percent) were male, and 80 percent were married.

Although efforts to describe the potential clientele for a business are laudable, the wide band of characteristics attributed to the trader to date is too general to be really useful to sales representatives. Pure conjecture would lead one to such conclusions as "Potential clients should have adequate resources," which would eliminate most young people, who have not yet had time to acquire speculative capital, as well as people in the oldest segment of the population, who are often more concerned, and properly so, with capital preservation than with growth. Farmers are familiar with futures. Engineers like trying their hands at developing trading systems. The excess of male traders harks back to the former practice of many brokerage firms of rejecting female accounts or, at least, discouraging business from women.

The job of all salespeople is to identify the buying motives of their clients and to present selling points that will appeal to those buying motives as much as possible. In a broad sense futures clients are motivated by some combination of the desire to make significant money and the desire to play an exciting game for the sake of playing it. The two most common conflicting motives with which registered commodity representatives must deal are greed and fear. Most investors would be glad to realize substantial gains from futures trading but are afraid to pay the price, namely, the risk of loss.

Registered commodity representatives should be prepared to give honest answers, whether the questions asked are actually asked or only implied. Most potential clients can be expected to ask what gains can be expected from successful trading. Sales representatives' answers should be based on something more than pure conjecture, hope, or selective perception, but must in no way offer any assurances of profits. The sales representatives should realize that the fears expressed by prospective clients may not be their basic ones. Many people are concerned with possible substantial deficits, endless limit moves, or physical delivery of the future in which they are trading, but their real doubt is most likely based on simple ignorance or the apprehension attendant on losing money. They must be made to realize that the risk of loss must be accepted in any venture in which the profit potential exceeds the interest paid on a bank savings account. The sales representative should neither fan the greed nor quell the fear beyond reason, but should try to contain both within reasonable bounds. Clients who expect to double their money monthly, and others who are afraid that opening a small futures account could easily result in a foreclosure on their homes, are equally guilty of faulty thinking and should be corrected.

One frequent problem centers on the question, expressed or implied, of the sales representative's own success in the futures markets. In effect, if the opportunities are as vast as often implied, why is he not rich himself? Handling this question is neither so difficult nor so embarrassing as one might think. Basically, the good sales representative deals with this question as with all others; that is, merely by telling the truth. One possibility, of course, is that he *is* rich and has accumulated his wealth by following his own advice. There are many others, however. The sales representative may be too young to have accumulated enough capital to justify speculating. He may be conservative in nature and more concerned with not losing than with the chance of winning. The sales representative, like any other customer of a financial firm, should adapt his financial merchandise to his own nature. It is also possible that he has a talent for guiding others, although he cannot play the game well himself. This situation is analogous to that of the athletic world, in which many excellent coaches have never been good players and many good players could never succeed as coaches. Other sales representatives feel that trading their own accounts would create a bias in their handling of clients' accounts and that they would have to make a choice between one direction or the other. They may conclude that in their own trading they would make important money 4 or 5 years out of 6, which is true of most successful professional traders, but that by handling accounts of others they will make reasonably good money 6 years out of 6.

The motivations and fears of their clients should be clear to the sales representatives. Both are described at considerable length in other chapters.

Skill in Selling

In addition to natural talent, some training is necessary to develop an effective sales representative. Procedures of the firm as well as the principles of selling must be learned. Some of this training is the responsibility of the firm employing the sales representative, although this responsibility is frequently abdicated by having inadequate classes conducted by people who have little more expertise in the subjects taught than the trainees themselves or by those with expertise but without the ability to teach. Regardless of the quality of their firms' training, sales representatives should be willing to improve themselves by learning what they can about the futures area and how to present themselves and their ideas effectively.

The principles of describing the product, meeting a client's objections, and closing sales in futures positions are similar to those in selling any intangible product and are not presented here in detail. Most of them can be handled merely by knowing enough about the field to answer questions and making suggestions reasonably and honestly. Prospecting for new clients is so important and, for some, so difficult that it warrants some discussion.

When thoroughly trained sales representatives have passed the necessary tests and obtained the required registrations, they are ready to begin prospecting. This is not a popular activity with most sales representatives, but in the investment business it is never-ending. Not only would most sales representatives like to have the largest clientele possible, but they would also prefer to improve its quality.

Some sales managers reduce the subject of prospecting to its essentials: simply walk, talk, and meet the people. Finding customers thus becomes a simple numbers game. Approach enough people enough times and the result will be a number of interviews. Conduct enough interviews and the result will be the conversion of prospects into clients. Continue the process long enough and the result will be a large clientele of high quality. Basically, this philosophy of prospecting is quite correct, but new sales representatives may well question the source of all the people to whom they are supposed to walk and talk. If 10 contacts ultimately result in one interview and three interviews produce one new account, a hard-working sales representative can use up a great number of names within a short time. Replenishment of a real prospect list at a reasonable cost is not so simple as it may appear.

Some firms rely heavily on newspaper advertising, particularly of the kind that requires some sort of reply. Favorites include the coupon that is returned for literature, an invitation to call a sales representative who will provide desired information, and an invitation to a lecture. All of these usually provide names that result in new business and so are popular with sales representatives. For their employers who pay for the advertisements, however, this method is somewhat less popular. Although most people interested in trading futures read newspapers and magazines or watch television, most people, hence most readers or viewers, do not trade futures, and advertising rates must be high enough for the media to cover the costs of reaching their entire unspecialized audiences. A small number of publications and television stations are devoted entirely to securities and futures, but most of them appeal to those already engaged in investing rather than to potential investors. When the costs of preparing advertisements or television "shows" are considered in addition to the costs of following up leads developed from such media, the expenditures for each new name placed on a firm's prospect list may approach or even exceed the revenues reasonably expected to be gained from new accounts. Some of this may be justified by the firm's desire to engage in institutional advertising simply to keep its name before the public. When this motive is combined with the effort to gain new business, the total cost may be judged reasonable.

Lectures, often dignified by the title "seminar," are sometimes effective but are also sometimes delivered by the wrong speaker to the wrong audience. Not infrequently they are given by people new to the business who have not yet developed a clientele to an audience that has not formulated an approach to trading. Alternatively, they may be presented by more experienced sales representatives. Some may have changed locations or firms, and others may be trying to replace a clientele that has been lost or which must be constantly renewed because of attrition. There may or may not be a correlation between knowledge of trading and skill in making a presentation, but sometimes glibness is confused with wisdom, and some members of "seminar" audiences have been damaged by what they thought was sound advice. Even well-promoted, effectively delivered, and efficiently followed up lectures often result in the opening of only rather small, low-profit accounts, for sophisticated traders with large accounts seldom feel the need to attend. Workshops held regularly once or twice a week at the same location to examine current markets in a professional manner (not merely by indicating trend lines on a chart with a pointer) have proved quite successful for some brokers at a reasonable cost. The same prospective clients may return several times, thus allowing time for confidence to build, and they may bring friends. In addition, workshops tend to appeal more than general lectures to serious students of the market.

Conducting a seminar is a skill in itself and deserves some thought. Certainly the lecture should be carefully planned in every detail. A trader who will learn sooner or later that a well-prepared plan is the key to successful trading can hardly be impressed by a meeting at which the microphone does not work, the reading material is in short supply, the slides are shown upside down, or the number of chairs provided differs substantially from the size of the audience. Some problems can be avoided by asking for reservations by coupon or telephone. Although some who make reservations will not appear and others will come without reservations, a good approximation is at least possible. Some way of obtaining names and addresses inoffensively must be arranged if the productivity of the lecture is not to be defeated. Those who attend can sign in at the door, or a door prize can be offered. Names and addresses can be written on the ticket stubs to be drawn.

If the audience contains people of varying degrees of sophistication, the level of the talk should be determined by the least knowledgeable, but the talk must move fast enough to hold the attention of those who are more familiar with the markets. If analogies are used, the speaker should be careful to go from the familiar to the unfamiliar and not from one unfamiliar activity to another. Slide projections should be large enough to be seen clearly by those at the back and along the sides of the room. Questions should be answered at the end of the presentation to avoid breaking its continuity by permitting diversion into areas of interest to only small segments of the audience. When questions are allowed, answers should be concise. Long-windedness tends to stifle questions from other prospects who might open accounts if they could get just one more answer but are afraid that a question will result in another 20-minute speech and that they will never get home. Sixty seconds for each answer is usually long enough.

It is wise for speakers to consider in advance the most frequent objections to their products. If objections can be turned into selling points by treating the objectionable aspects to better advantage, then sales representatives have nothing to fear if they know their material and their answers are ready and well phrased. If questions that are difficult to treat favorably are expected, speakers can do much to lessen or forestall their adverse effect by raising them themselves before the audience does and by phrasing them as favorably as possible. Typical questions might involve the delivery of the cash commodity, the tremendous adversity that might be caused by a series of adverse limit moves, the unusual metal and interest rate markets of a few years ago, or the advantages and disadvantages of trading options rather than futures contracts.

Mass mailing undoubtedly brings in leads but has most of the disadvantages of advertising in mass media, especially the high cost per lead. Because traders have so few common characteristics other than speculative capital and a willingness to accept a risk, it is most difficult to define a mailing list that could prove especially useful, even presuming its availability. Lists of doctors, dentists, airline pilots, and those who have written to exchanges for information are especially overworked. Even sales representatives who "work a list" often do so ineffectively. It is important to keep good records when contacts are made, eliminating names only when accounts are opened or when it becomes evident that they never will be. Too often a sales representative is unwilling to approach prospects who would become accounts only after four, five, or even more contacts. It is usually unwise to attempt to sell accounts or positions to people by mail or telephone. It is more productive to rely on interviews, during which the sale of an account is easier. It is also easier to determine whether a prospect would make a suitable account at a face-to-face meeting.

Unannounced personal calls are unquestionably sometimes effectively made but are generally unpopular both with prospects and with sales representatives. Prospects, especially busy ones, often resent being disturbed at a time convenient only to the sales representative, and many sales representatives believe that the time consumed in seeking out a qualified prospect is beyond reason, especially in large cities. In addition, it places the sales representatives in a difficult psychological position. They are selling a trading activity that is supposed to present a handsome profit potential while they themselves are walking door-to-door looking for customers. Any attempt to explain this away because one is new in the business is futile, for customers will soon realize that they can pay their commissions to a sales representative who is too well established to take the time to ring doorbells.

A more effective way to meet people is by personal radiation; that is, by joining and working in various organizations and gaining the friendship and respect of other members who might open accounts. It is important, of course, not to become an obvious "glad-hander" who is usually more avoided than patronized.

Many new sales representatives believe that the difficult task of building a list of clients will take only a few months and that after a brief period a substantial clientele can be relied on to provide a good lifetime income with the commissions they will pay. This, however, is not the case. Attrition among traders, especially after a few recommendations have worked out badly, is the rule and not the exception. Referrals by satisfied clients provide less business than might be expected. Losers rarely make any. Even winners are sometimes reluctant to suggest highly speculative ventures to their friends for fear that they will be held accountable for any losses suffered and ultimately lose their friends with no hope of personal gain. (This fear is probably well founded.)

Sales representatives employed by full-line wire houses are often able to convert some of their stock clients into futures clients. Such conversions typically account for about 70 percent of the traders in futures, but although speculators in the securities markets are an obvious source of clients, they are also a source of a number of problems. Sometimes sales representatives become overenthusiastic about the opportunities in futures trading and induce stock clients to trade futures for whom futures trading is unsuitable, and sometimes they overestimate the skill involved in their own or their firms' short-term success in selecting futures positions and underestimate the risk, after which the clients claim misrepresentation. Even in the case of a speculatively inclined client for whom futures trading is suitable it frequently happens that an unsuccessful venture into futures trading on a relatively small scale ultimately causes the loss of the larger stock account, which might well have proved profitable over a period of years. It is for this reason that many executives of brokerage firms look unfavorably at such conversions. Some will separate security and futures activities completely by having different sales representatives handle the different products or even by maintaining entirely separate futures and stock offices. Some will eliminate futures trading from their firm's portfolio of products altogether, which might, however, cause a stock account to be lost to another firm offering a greater variety of financial merchandise.

MAINTAINING A FUTURES CLIENTELE

The ideal way to maintain a profitable futures clientele would be to provide a continuous stream of highly profitable trade suggestions. If sales representatives can do this, they will not need to be unduly concerned with servicing their clienteles because they will have difficulty losing a customer, even intentionally. Registered commodity representatives who have a trading method that has been validated in real time or who have a high degree of market judgment that permits them to select the positions of others will easily build and retain a substantial clientele. Just as surely the sales representatives who pass on shallow opinions based on superficial observations of a quote board, tape, or naive chart cannot in a real sense succeed. Depending entirely on good trading results to maintain a futures clientele will seldom lead to success. If sales representatives suggest unprofitable trades, they will, of course, lose their clients because the clients will lose their money, their faith, or both. Even if the clients select their own positions, the sales representatives will lose them sooner or later either because they will lose their capital or because they will find a way to justify blaming the sales representatives and their firms for the results, although neither had much to do with them. There are, however, some positive courses of action that sales representatives can follow that will help them maintain their clienteles.

The registered commodity representatives of most wire houses have a full line of merchandise. They should not induce their clients to trade in the parts of their line that they prefer either because they are most profitable to them or because they fit their personal biases. Neither should they attempt to persuade their clients to avoid trading in areas in which they themselves have not been successful. Sales representatives handling investment and speculative vehicles would do well, in the long run, as would sales representatives handling anything else, to adapt their product line to the wishes and needs of their clients rather than to adapt the clients to the items they prefer to sell. They should be careful neither to exaggerate nor to understate the profit potential of their security or futures lines. Sales representatives who speak convincingly of annual expectations of 100 percent or more will undoubtedly open many accounts, but will just as surely lose them when it becomes evident that they cannot possibly meet the standards they have set for their own performance. Understating objectives can be just as harmful to clients who have invested a small amount of money in a conservative venture yielding a small return when they might have made a greater gain in a more speculative venture. It is always best for sales representatives to tell the truth about their merchandise, as far as they know it, and not attempt to expound when they do not know the facts. They must stop short of the point at which the clients make their own decisions concerning the amount of risk to take. Sales representatives should make every effort to provide honest guidance, but they should never try to be their brother's keeper.

As far as possible, sales representatives should avoid becoming personally responsible for trades. Some may feel that the role of order taker is below their dignity and prefer to insert themselves into trades suggested by their research departments or by their customers, but this is seldom wise. Those who do will learn sooner or later the truth of the aphorism "When I am right, no one remembers—when I am wrong, no one forgets."

SERVICING A FUTURES CLIENTELE

In the servicing of a clientele one of the least popular but most important tasks is record keeping. If a client asks what her position is or when she established it and at what prices, she is entitled to a prompt and correct answer. Sales representatives who are days behind in their posting or do not do it at all do not deserve the continued patronage of their clients. Failure to maintain accurate records can result not only in the justified loss of clients because of poor service but also in costly errors. One of the most important ledgers is the holding record, in which are entered the name, account number, telephone number, and market positions (including prices and dates) as they are taken and liquidated for each client. Entries should be posted in this record book as confirmations are received or, at worst, at the end of each day. It should be available and open to the client's page while the sales representative is speaking to the client. Relying on memory to fill an order can be a serious matter, and using an erroneous account number can have surprisingly grave results. The client who places the order will not get a confirmation and will suspect that his order was neither promptly nor properly handled. Another of the firm's clients who did not place an order will get a confirmation and will wonder whether trading is being carried on in his account without authorization. The back-office effort required to correct the error may cost the brokerage firm more money than it earned for its commission on the trade.

Much more serious, if a posting record is not maintained, is the possibility of allowing a client to think that she is liquidating a position previously liquidated, with the result that an unwanted position is created. A market order may be entered and an open order forgotten which, when filled later, can cause the same position to be established or liquidated twice. Misunderstandings in directions are easier if written records are not consulted. Sales representatives may find that they have tried to liquidate a short position by selling or a long position by buying. They will therefore have two positions instead of one. It may appear that the market will make the latter prove profitable half the time, but for some reason this seldom seems to work out. (Somehow, when someone drops a piece of toast onto the floor, it seems to have an uncanny way of landing buttered side down.) Losses incurred because of these or similar errors are almost invariably borne by the brokerage firm and, in turn, by the sales representatives themselves, at least in part. In most cases the sales representatives deserve their losses. With the advent of computerized record keeping and electronic communications, some of the problems discussed here have been alleviated by some firms, which send daily accounting to branch offices and often to individual sales representatives. Such records, often called "equity runs," indicate positions in each of a sales representative's accounts, including such information as the credit balance, the price at which each open position was established, the margin in use, and the margin excess or deficiency. Such information can eliminate many problems if it is accurate and if it is utilized by the sales representative.

It is also wise for sales representatives to maintain computerized records organized by futures in order, if they wish, to determine quickly which of their clients or prospects is interested in a given market. This record is especially important in the servicing of clients who rely on the advice of a brokerage firm. If a client enters a position that the firm later recommends should be liquidated and is not called promptly, he will not react happily to the news that he has suffered a loss or lost his profit because the sales representative forgot that he had a position. When a sales representative posts an entry in a customer's file, it takes only a few extra minutes to post an entry in the cross-file. If the news wires, the financial journals, the government, or the firm itself releases any information that could be of interest to clients holding positions in various futures, it is easy for the sales representative to identify them and convey the information to them by mail or telephone. For the sales representative who is trying to increase the size of his clientele, it is also wise to post in his cross-file the positions of potential clients with whom he is in some communication and keep those clients informed of matters that are pertinent to them. His service may prove to be better than that offered by their present brokers, who may be taking their business for granted. Eventually some or all of this business may be acquired. If a sales representative ranks second on the lists of a large number of people who are determining where to place their business, she will ultimately receive a surprising number of accounts as the first choices fall out of favor. This happens frequently as customers become disenchanted with trade selections, when confirmations of trades are not received promptly or are considered to be unsatisfactory, when information is not passed on promptly or accurately, or when a check is not sent out quickly on request. Because a substantial number of traders have more than one account or have traded with more than one broker, being next in line can prove to be most lucrative.

Because most accounts are opened after several contacts, it is important to maintain a lead file. This may be no more than an alphabetic file of prospects, but it can prove to be invaluable. The best-organized files also have a tickler section organized by date. If a prospect suggests calling back at a later time when he expects to have raised some capital or to have returned from a trip, the sales representative can file his card under a future date to remind himself to call again at the proper time.

To service clients well, as well as to determine their suitability for trading, it is most important to establish what is expected when an account is opened. Some clients will prefer to follow the suggestions offered by the firm or the sales representative. It is necessary to find out what kind of information they will need and when and where they wish to be called. Some of them will ask the sales representative to enter trades for them all the time or when they cannot be reached, but if this is allowed by the firm, the understanding between the client and the broker should be quite clear. The understanding, of course, should be supported by any documentation required to avoid accusations of unauthorized discretion.

Other clients prefer to make their own decisions and do not care to be influenced even by comments about their own choices, much less have trades suggested to them. Presuming that such clients do not lose their money or decide to trade elsewhere for reasons beyond the control of the sales representative, all that the latter need do is provide good service. This involves little more than maintaining accurate records, confirming a client's trades promptly, entering orders properly, and making sure that the telephone is answered. A sales representative who has many clients of this kind would do well to form a partnership of some sort with another registered representative to make sure that his phone is answered at once when he is away from his desk or office or on vacation.

It is in handling self-traders that brokers are really able to excel. This is especially true of young brokers who find no need to explain away their lack of experience as they would have to do with a customer who demanded more detailed direction. All that is necessary is to have a good working knowledge of the procedures of the business and to observe and pass on currently important information and facts rather than offhand opinions, glib guesses, and bluffs. The client who makes her own decisions has the right to expect really outstanding personal service in return for the often significant commissions she pays. Sales representatives who limit themselves as much as possible to giving good service and passing on facts requested by their clients will not do as much business in the short run as their bolder counterparts who are willing to make specific suggestions, but they are quite likely to do more in the long run, build a better reputation, and sleep better at night.

Many sales representatives may be dissatisfied with a role that is little more than order taker, but reflection may convince them that it can be more important than it appears. If a sales representative has no reason to believe that either her personal trade suggestions or those of her firm will lead to long-term success, she is left with two functions that she can perform well, both of which are vital. One is the proper servicing of the customer's account. The other, which is even more important, is acting as a customer's alter ego to help jog him along the right road. For example, a customer may tell his sales representative that he believes that every position taken should be protected immediately with a stop order, yet he may omit placing such an order. The sales representative who asks "Where do you want your stop?" and causes one to be entered may be performing a service far more important than that done by the sales representative who calls his clients to tell them that wheat is acting well because it has been up for 2 days and that they should consider taking a long position.

Registered commodity representatives who guide their clients toward logical money management can make a vital contribution to their success. They can avoid reinforcing their clients' errors by acting as if all were well. If they do not know, they should say that they do not know. When clients show loser's characteristics, brokers can take steps to induce them to change their ways before it is too late. "You never go broke taking a profit" warns of taking short profits. "I'm locked in" warns of a person who will not take a loss. "I'll watch it" is a clear indication of a lack of planning, which is the most certain way to lose sooner or later. Sales representatives who learn the correct approach to trading, develop sufficient authority to warrant a hearing, and communicate well enough to deliver their messages effectively can build a rewarding futures clientele and serve and maintain it well.

APPENDIX

Preparation for the National Commodity Futures Examinations

The National Futures Association (NFA) Associated Persons Examination (Series 3) is required of anyone who wishes to become registered as a commodity solicitor with the regulated commodity exchanges in the United States. The test itself consists of multiple-choice and true-false questions. In its initial form, it consisted of 125 questions, and the examinees were given 2 hours to answer. A score of 70 percent was designated as a passing grade. The structure of the test is subject to change.

Examinees are provided with reading material and sample test questions by the brokerage houses that employ them and by the NFA. Although the test is periodically updated, there are 10 areas of knowledge that will prove to be of substantial assistance in passing the test:

1. *Government agencies and commodities exchanges.* The organization and responsibilities of many relevant government agencies and commodity exchanges, including the jurisdiction of key exchange committees, are examined.
2. *Glossary of futures markets terms.* A significant amount of time should be spent studying the general definitions of such terms as "normal," "carrying-charge," "inverted," "overbought," "oversold," and many others which describe price relationships and the behavior of the futures markets.
3. *Type and ownership of accounts.* The examinee should be familiar with the various methods of carrying commodity futures accounts and the legal aspects of the major alternatives.
4. *Speculation, hedging, gambling, and investing.* Some time should be devoted to defining these terms and comparing and contrasting their roles.
5. *Margin and margin calls.* The exam will include questions about setting margins and the responsibilities of the exchange, broker, and customer relating to margin activities.
6. *Technical versus fundamental analysis.* The applicant should be able to compare and contrast the elements of each approach to trade selection.
7. *Types of orders.* Study should include orders of all types—their wording, application, and limitations.
8. *Spreading.* The exam will emphasize the theory of spreading, including the types of spreads and their application.
9. *The soybean complex.* The examinee should understand the relationships in the complex, including the crush, reverse crush, and conversion equivalents between soybeans, soybean meal, and soybean oil contracts.
10. *Contract facts.* For each commodity the applicant should know
    contract size,
    reportable limit,
    position limit,
    commission,
    minimum and maximum allowable price fluctuation,
    whether regulated or unregulated,
    contract months traded,
    delivery procedure, including any special rules for retenders.

Sample Questions

The following are typical questions asked on the exam. An answer key follows the questions (although there are undoubtedly those who would disagree with the answers suggested).

1. Which of the following is *not* necessary for handling a discretionary account?
   - ***a.*** Written approval of client before entry of each order
   - ***b.*** Written confirmation after the trade
   - ***c.*** Original authorization from the customer
   - ***d.*** All of the above
2. The basis is
   - ***a.*** The difference between one future price and another future price
   - ***b.*** The difference between cash and near future prices
   - ***c.*** The future price divided by the cash price
   - ***d.*** None of the above
3. The protection of customers' funds by special handling procedures is the responsibility of
   - ***a.*** The contract market
   - ***b.*** The clearinghouse
   - ***c.*** The commission market
   - ***d.*** The Commodity Futures Trading Commission
4. Every Monday figures are released on visible supplies, as compiled by the
   - ***a.*** CFTC
   - ***b.*** Clearinghouse
   - ***c.*** Chicago Board of Trade
   - ***d.*** Department of Agriculture
5. A soybean processor who buys beans and sells the products in the futures market would be placing a(n)
   - ***a.*** Reverse crush
   - ***b.*** Processor conversion
   - ***c.*** Crush hedge (putting on crush)
   - ***d.*** Intermarket spread
6. True or false: Speculation in commodities increases the range of price fluctuations.
7. True or false: Open interest in a given delivery month is the total long and short positions held in that month.

8. The CFTC is interested in all of the following except (more than one is possible)
   - *a.* Limits on maximum positions
   - *b.* The prohibition of price manipulation
   - *c.* Testing of all commodity solicitors
   - *d.* The designation of a futures market as a contract market
   - *e.* Protection of customers' funds
   - *f.* Commodity broker registration
   - *g.* Specification of commodities covered
   - *h.* Registration of futures commission merchants
   - *i.* Registration of floor brokers
9. True or false: Bona fide hedgers must abide by position limits.

Answer key:

1. a
2. b
3. a
4. c
5. c
6. False
7. False
8. c, f
9. False

It should be emphasized that there is no necessary correlation between the passing of the examination and the ability to handle commodity accounts effectively. As in many other fields, the examinee often treats the test as a barrier that must be hurdled, not as an indication of real competence or as a substitute for experience.

13 CHAPTER

Compliance: I'll See You in Court

"The best way I know of to win an argument is to start by being in the right."

—*Lord Hailsham*

INTRODUCTION

Trading in futures involves important sums of money. It also involves people. Communication involves esoteric language and terminology that can easily lead to misunderstandings. Inevitably, therefore, disputes occur. Some are honest differences of opinion. Some are not so honest. Some of the more common areas of dispute, their causes, and how they are resolved will be discussed here.

This is not a law book. It is not intended to compete with tomes on commodity and security law. It will not present long lists of case references. The thoughts contained herein, however, are based on experience and practical observation in the course of thousands of negotiated settlements, lawsuits, arbitrations, and mediations. Perhaps some readers of this book—brokers, customers, and even attorneys—might avoid a problem or help solve one by reading on.

SOURCES OF PROBLEMS AND THEIR PREVENTION

Soliciting the Account

Representatives of commodity firms are basically sales representatives looking for business. Such representatives may be designated with a high-sounding title or euphemism, but they are sales representatives nevertheless. They are attempting to gain revenues for themselves and their firms. There is nothing wrong with this if it is done properly. There is considerable danger, however, if it is done improperly. Unlike most other sales representatives, those who sell futures are fiduciaries. Clients are asked to place trust and confidence in the sales representatives and their firms and are entitled to receive in return the utmost in good faith and fair dealing.

The Registered Commodity Representative Those who solicit and accept futures business are supposed to be registered by the CFTC. This involves the granting of a license after approval of an application for registration and confirmation that a test has been passed. If sales representatives are not properly registered, their firms have considerable exposure if clients solicited by such sales representatives later complain of damage. Sometimes clerical personnel go beyond the routine giving of quotes and basic information and get into the areas of soliciting and handling accounts. Firms might be well advised to follow a rule of when in doubt, get employees registered.

It should be pointed out that registration in itself does not mean that sales representatives are honest and reliable or that they know what markets are going to do. Registration only means that their personal records are not too bad or at least that they have been deemed to be rehabilitated from past transgressions and that they have passed any examination required by the CFTC or any commodity exchanges. The government and the exchanges certainly intend registration to indicate that a person is qualified to deal with the public or, at least, that the person is not unqualified. Unfortunately, such a license also tends to indicate to some a high degree of credibility and respectability, which is not always deserved. Most disputes with customers involve sales representatives who are properly registered.

Representations Potential customers are looking for someone who knows what markets are going to do so that they can make a large amount of money quickly from a small capital base. Although most sales representatives have no idea at all what markets are going to do, some are not above implying that they have excellent sources of valuable information. The combination of a customer and a sales representative whose ignorance of the markets differs only in some small degree can be quite dangerous and provides a potentially serious problem for both. If the sales representative professes to have no forecasting ability or sources, he will have difficulty opening most accounts that require more than order taking. If he indicates that he has inside information, that his research department is almost invariably correct, and that he and most of his accounts consistently make large amounts of money, he may find himself in great difficulty one day when asked to prove these points. He may learn the meaning of such ugly terms as "material misrepresentation" and "reasonable basis." The customer, of course, can be damaged by being lulled into underestimating risks and overestimating the size of potential rewards and the probability of obtaining them; the result is the loss of his capital.

The sales representative who makes a call, conducts a sales meeting ("seminar"), or mails literature really should not have a problem, nor should her potential customer. All the sales representative has to do is tell the truth. All the customer has to do is spend a little time investigating the reputation of the sales representative and her firm, understand their products, and remember that potentially large rewards entail risks equally as great or greater virtually without exception.

Opening the Account

Before a customer can trade futures, he or she must open an account with a brokerage house qualified to deal in futures. Most such brokerage houses are registered with the CFTC as futures commission merchants. Opening an account entails completing various documents and depositing funds. These subjects cannot be discussed exhaustively here, but at least the most common areas that lead to trouble can be identified and some solutions suggested.

Suitability Lack of suitability, real or alleged, is high on the list of trouble areas. The CFTC, neither through the act which created it nor through subsequent regulations, specifically requires that a customer be suitable. Those who conclude that suitability for trading futures is therefore not required of a customer, however, are almost certainly wrong. The CFTC has long considered suitability requirements and went so far as to have public hearings and request comments on the subject at least as long ago as 1977. When it failed to adopt a specified regulation, the commission indicated that it had been unable to formulate clear standards and that a specific rule would only serve to limit principles considered to be implicit in the Commodity Futures Trading Commission Act of 1974.

Suitability of customers trading securities has long been established by the "know your customer" rules of most major exchanges, by the Rules of Fair Practice of the National Association of Securities Dealers, and by custom. The latter is no small consideration. Custom, which arises out of well-established industry practices, is considered by many to have all the force of law, and this view is probably well taken. It is also possible that a brokerage firm may have a contractual duty to enforce the rules of the exchanges of which it is a member, and it may be bound further by common-law implications concerning fiduciaries. In that a brokerage firm is generally deemed to have a fiduciary relationship with its clients, a suitability requirement would also be deemed to exist. The degree of responsibility to establish suitability requirements probably varies depending upon whether orders are solicited or unsolicited.

Suitability is determined primarily by asking the customer questions and indicating answers on the new-account form or a customer information sheet, sometimes supplemented by credit reports. Although it is not unusual for the sales representative to complete the form, it is usual for the customer to sign it. It is not uncommon for a form to be completed in a cursory or hasty manner, with the result that disputes later arise as to what was said, who said it, and when it was said. Sometimes customers allege that sales representatives completed blank forms on the basis of pure conjecture after they (the customers) signed them. If sales representatives or their customers would complete the forms carefully and if the customers would sign only after reading what was filled in, a substantial number of problems would be avoided.

Suitability requirements basically fall into two areas. One of these involves financial capacity, and the other centers upon the objectives of the customer. Financial capacity is the easier of the two to deal with because it involves quantitative factors, which always appeal to administrative and regulative minds. A beginning is total net worth. Many believe that the more assets one has, the more one can afford to risk. Many attempts have been made to break down total net worth into components of varying degrees of importance. The component of particular interest to brokers is liquid net worth, which, as the name implies, is available upon short notice. Houses, trust funds, furnishings, and automobiles are of value to the holders but are of little interest to brokers except under extreme circumstances. Cash and cash equivalents are of greater interest. How much of this liquid net worth is to be deposited in the brokerage account is of the greatest interest of all.

The second broad area of suitability is far more complex. A broker's recommendations should be consistent with the temperament, objectives, and needs of a customer. A customer, however, may say one thing today and another tomorrow depending upon the degree of success of his trading. His objectives and attitude may change as his fortunes improve or deteriorate or as he becomes more experienced, but brokerage firms seldom update the forms completed when an account is opened to indicate such changes. A broker has the obligation to know her customer every day and not just on the day that the account is opened. In the latter case the information written on account documents may become invalid with the passage of time.

It is usual to attempt to determine objectives on the basis of such obvious factors as age, education, dependents, employment, and home ownership, but this is not easy. As people get older, some become more conservative and some less. Education is not synonymous with wisdom or good judgment. Dependents may become more or less self-sufficient over time. Lack of employment may indicate that a client is on the brink of starvation, but it may also indicate that he has acquired sufficient wealth to allow the destruction of his alarm clock. Home ownership may be regarded by some as a financial burden and by others as a source of wealth if real estate values rise. Some people are intrinsically more aggressive financially than others, and they have every right to feel about their money as they choose. What is considered necessary by some people may be considered luxurious by others. In that people are often best judged by what they do rather than by what they say, it might be best for brokers to rely most strongly upon how customers have handled their financial affairs in the past.

Risk Letters It is always wise to maintain a paper trail where disputes are possible. Accordingly, it has long been usual for cautious brokers to require new customers to sign some kind of form indicating that they are aware of the financial risks of futures trading and even to request from time to time that customers indicate in writing that they are being treated satisfactorily. These procedures have been supplemented by the CFTC, which has prepared a formal risk disclosure statement covering five common areas of dispute which must be provided for a customer, dated, and signed by the customer before an account is opened. The customer's acknowledgment indicates that he or she has received the document and understands it. The language of the disclosure statement must be exactly as follows:

> **Risk Disclosure Statement**
> This statement is furnished to you because rule 1.55 of the Commodity Futures Trading Commission requires it.
>
> The risk of loss in trading commodity futures contracts can be substantial. You should therefore carefully consider whether such trading is suitable for you in light of your financial condition. In considering whether to trade, you should be aware of the following:
>
> (1) You may sustain a total loss of the initial margin funds and any additional funds that you deposit with your broker to establish or maintain a position in the commodity futures market. If the market moves against your position, you may be called upon by your broker to deposit a substantial amount of additional margin funds, on short notice, in order to maintain your position. If you do not provide the required funds within the prescribed time, your position may be liquidated at a loss, and you will be liable for any resulting deficit in your account.
>
> (2) Under certain market conditions, you may find it difficult or impossible to liquidate a position. This can occur, for example, when the market makes a "limit move."
>
> (3) Placing contingent orders, such as "stop-loss" or "stop-limit" order, will not necessarily limit your losses to the intended amounts, since market conditions may make it impossible to execute such orders.
>
> (4) A "spread" position may not be less risky than a simple "long" or "short" position.
>
> (5) The high degree of leverage that is often obtainable in futures trading because of the small margin requirements can work against you as well as for you. The use of leverage can lead to large losses as well as gains.
>
> This brief statement cannot, of course, disclose all the risks and other significant aspects of the commodity markets. You should therefore carefully study futures trading before you trade.

Such letters have sometimes helped avoid disputes but not as often as they should have. Sometimes the broker neglects to get the letter signed, gets it signed after rather than before the account becomes active, or fails to retain it. The customer is supposed to understand the statement, not merely read and sign it. If the customer is rushed into signing the form without having a chance to absorb its meaning, the broker may have a legal exposure. This is especially true if the customer is not given a copy of the form. It is also important to note that the form may not cover all circumstances. Certain markets may entail risks which are peculiar to those markets, and this may not be clear from the risk letter. If there are special risks or other material items of information which warrant disclosure or if it appears that the customer did not really understand the risk statement, a signature alone would almost certainly not protect the broker.

Special Types of Accounts There are a large number of accounts which require special documentation. These include business accounts which involve partners' rights to act on behalf of one another, corporate accounts which involve the right of a corporation to trade futures and the question of who can act for it, trust accounts which have special restrictions, accounts of minors, joint accounts, and many others.

In every case, the means of avoiding trouble are virtually the same. Whatever should be disclosed should be disclosed fully and clearly. Papers should be completed accurately; understood and acknowledged by the client, who should be given copies; and approved by a supervisor. This approval should involve more than a routine skimming. Poor supervision is not excused by maintaining that there is too much for the supervisor to do.

Deposit of Funds An important element of opening an account is the deposit of funds. As the relationship between a broker and a client matures, trust and confidence may well grow with it. Initially a broker would be well advised to have good funds in the account before trading begins, regardless of any financial data provided by the client. Most people are honest and reliable, but not all are. Futures trading may result in large profits or losses rather quickly. If a client suffers a large loss and then refuses to deposit money, the broker may find it difficult or impossible to cover the loss and may have to bear it himself. Even if money is eventually collected, getting it may prove to be a costly and time-consuming process.

The term "good money" is a term of art and is worth a few words of explanation. It means that funds are firmly in hand. Cash, cashier's checks, certified checks, and such negotiable government securities as are acceptable for margin purposes exemplify good money. Personal checks, promises to send such checks, and assurances that checks are in the mail are not good money. Brokers who do not have good money on hand at least for initial transactions in the accounts of new customers are taking risks not justified by their potential revenue from commissions.

The amount of money required to be on hand should be at least enough to meet the requirements of positions established, including enough to cover reasonable short-term adversity. Most brokerage houses require that a flat minimum amount be deposited to open an account. Although this amount may not need to be maintained, it at least indicates the ability of a client to make a deposit if required to do so.

If the funds deposited in the account are borrowed, the client's exposure to risk is increased, and this has suitability implications. If a broker knows her client, as she is expected to, it is not unreasonable that she at least should make an attempt to ascertain the source of funds deposited in an account.

Handling the Account

Although the relations between brokers and their clients have many gradations, there are three basic types. In the first, the client makes all decisions, and the sales representative acts only as an order taker and record keeper. In this case, the fiduciary duties of the broker are minimal but still exist. They involve primarily but not exclusively the accurate and timely handling of orders and the proper administration of the client's account. At the other extreme, the client follows all or most of the sales representative's suggestions and provides little or no direction of his own. In this event the fiduciary responsibility and hence the exposure of the broker are high. The third possibility is the most common relationship, wherein the sales representative and the client compare ideas and action results from their joint inputs. Most but not all of what follows applies to the second and third types of relations.

Trade Suggestions If a sales representative suggests that a customer enter a futures position, the customer has no right to assume that a profit is guaranteed, although some people seem to think that this is the case. A sales representative can only offer his or her best judgment and represent it as such.

It is when sales representatives promise more than they can deliver that the basis for trouble is established. Sometimes a source of information is said to be far better than it really is. This is particularly true of technical devices, often of mysterious nature, which are said to have yielded large gains most of the time. Too often, it is impossible to locate all the people who were supposed to have reaped the benefit from the devices. The solution for this is quite simple. If sales representatives tell the truth, have a reasonable basis for a recommendation, and can document it, they rarely face any problem.

A second problem involving trade suggestions has to do with the sizes of positions recommended. A sales representative may recommend a position so large that it is later considered unsuitable for the client, who did not realize the exposure incurred. The recommendation may have been made in good faith, but that does not eliminate the problem. Almost any sales representative can attest to the maddening tendency of recommended trades to fail immediately after the completion of a major campaign, thereby wiping out his entire clientele, but to succeed when only one contract has been placed and that in the account of his brother-in-law, whom he does not like much anyhow.

Documentation of Orders When an order had been placed by a customer, whether it was solicited or not, it should be written down and a record immediately made of the time. The order should then be sent promptly to the proper exchange, and the time that it was sent should be immediately recorded. If the order is filled, canceled, or changed, again, a record of the time should be made immediately. Three time stamps are the usual minimum that any order requires. Although mechanics may vary with the firm's procedure, these time notations should be made promptly and accurately, whether done by the sales representative, a wire operator, or exchange floor personnel.

Failure to transmit orders promptly and accurately provides the opportunity for many types of disputes, some involving mere negligence but others, outright fraud. A delay in transmitting a market order may cause a loss because of a price movement during the delay. Of course, the delay may also cause the order to be filled at a better price, and one would think that this problem would average out, but it does not. It has been said that when one drops a piece of toast, the probability is that it will land buttered side down and that this probability increases directly with the cost of the carpet. So it goes with delayed orders. If a limit order is delayed, matters are even worse because the market may be missed altogether.

Orders should be completed before being sent. They should not be transmitted without account numbers or sent in bulk. Incomplete orders provide the opportunity to assign account numbers after the market has moved enough to establish a significant profit or loss in some cases. Sales representatives are then in a position to assign profits to favored customers, including themselves, and to assign losses to those less fortunate. Changing account numbers after an order is filled provides the opportunity for similar abuses or, at least, their appearance.

The solution for most of these problems is for orders to be completed and time-stamped properly and for supervisors to make certain that brokers and clerical personnel are not permitted to engage in loose or questionable procedures. Changes in orders should be satisfactorily explained and documented. The orders and related documentation should then be preserved for no less than 5 years.

Discretion The securities markets generally permit time or price discretion by the broker without a formal power of attorney (trading authority). Some futures exchanges, however, permit no discretion whatever without formal authority. Sometimes a broker, having had a long and good relationship with a client, will make trades without authority. This is done at the broker's peril. If there is no power of attorney, any degree of discretion is unauthorized and constitutes a violation of the exchange rules and industry custom. Given enough monetary incentive, even the friendliest client can become quite unfriendly on short notice. Sales representatives who bend the rules may merely be attempting to do their best to serve their clients, but they are taking a risk far beyond any possible reward.

Most problems in this area may be avoided by a broker if no discretion is taken without a properly executed and current trading authority. Of course, the trading authority itself may lead to other problems, which will be noted below. In addition, an unscrupulous client may accuse a sales representative of using discretion when this was not the case. The latter could be eliminated or sharply reduced if brokers generally chose to record or log all telephone calls in a legal manner, but many, especially major firms, consider this to be somehow unprofessional and believe it would be resented by clients. Such recording might lower revenues somewhat, unless all brokers did it, but legal exposure would certainly be reduced if sales representatives and clients knew that telephone calls could be reconstructed.

Record Keeping Clients are supposed to receive accurate confirmations of all trades as well as purchase and sale agreements promptly. In addition, they get periodic reports of the status of their accounts, usually monthly, indicating at least the cash balance, the open positions, and the equity. These and any other communications should be reviewed shortly after being received and the broker notified of any discrepancies.

Sales representatives are usually provided with a daily equity run indicating the status of all accounts handled by them, including open positions and the margin excesses or deficiencies. Some keep individual records organized by client or by individual future so that they can inform clients of any relevant news items. Brokers who are especially bright or battle-scarred sometimes keep accurate telephone logs and copies of letters mailed to clients confirming their understanding of how an account should be handled. In the event of a dispute, such records are of great value, but because brokers tend to be sales rather than bookkeeping types, many tend to be quite lax about maintaining such paper trails, sometimes to their great regret.

Churning There are so many disputes involving churning, real and alleged, that the subject deserves careful attention. Futures trading is usually short-term in nature. It therefore frequently results in a large number of transactions in a short period. Each transaction results in a commission. Many clients who lose money tend to blame the broker and resent the commissions. It is only one more step to accuse the broker of initiating the trades primarily to generate the commissions. Abuse of a client's account by excessive trading in order to increase the broker's profit is churning. Such conduct can create great financial exposure for a broker, ranging from the return of all commissions to large assessments of damages. The latter might include money lost, money which might have been made (benefit of the bargain), or even punitive assessments well in excess of what was lost. Along with outright gross misrepresentations, churning probably ranks among the most dangerous practices by a broker.

Generally, churning involves three necessary conditions: benefit to the broker, excessive trading, and control by the broker. The first of these is usually obvious. If the sales representative benefits from the commissions, either directly or by achieving a higher salary level, larger bonuses, or more job security, he or she profits from churning.

Excessive trading deserves somewhat more consideration. It is tempting to measure excessiveness quantitatively. Typical measures are commissions paid, the number of transactions, and the turnover of capital. If these numbers are large, they are quite useful for impressing judges, hearing officers, and juries, as well they should be.

There is, however, no law of the Medes or Persians to indicate that "excessive" and "many" are synonymous terms. "Excessive" simply means "too many." If one trade is deemed to be unreasonable because it was made for no good reason, it could undoubtedly support a churning allegation.

This is not to say, of course, that most churning cases have been and will probably continue to be based on a large volume of transactions.

It is on the third element of churning, namely control, that most cases in this area tend to center. If a broker has a power of attorney which is exercised regularly, control is probable. This fact alone might be reason enough for a broker not to accept such a power. If a broker does not have a power of attorney and has not exercised discretion without authority, the establishment of control must be determined on a case-by-case basis.

Barring authorized or unauthorized discretion, control must be determined by ascertaining how much influence the sales representative has over the client. This does not require any Svengali-Trilby type of relationship; rather, it requires dominance through force of personality or the client's assumption that he knows so little and the broker so much that there is no point in meddling. De facto control by the broker may be assumed if the broker has suggested all or almost all transactions and all or most of these were accepted by the client with none or few being rejected unless it is clear that the client has sufficient capacity to disagree but chooses to acquiesce to the broker's suggestions.

The three elements above are all that need to be proved to indicate churning, but trading patterns in the account may be utilized to reinforce the suspicion of this abuse. The more common of such patterns include average losses of larger dollar amounts than average profits; losing trades that are typically held longer than winning trades; more frequent trades and the largest losses occurring late in the account's history; few contacts with the client that are initiated by the sales representative, especially when the client is losing; frequent spreading with small profit potentials or to avoid realizing losses; more trading activity than in accounts not controlled by the same sales representative; and notification of adverse trading results that is delayed or misrepresented by the sales representative. If there are a substantial number of day trades in a churned account, typically most will show profits.

Although determining that an account has been churned is not an exact science because some of the above trading patterns may also occur in accounts controlled by the client, it is surprising to note how many of these elements are present in cases where an account has been determined to have been churned.

Margins In the securities area, margins are set by the Federal Reserve Board of Governors, although the requirements may be increased by exchanges, individual brokerage houses, or both. In addition, actions to be taken by the brokerage house in the event of deficiencies are clearly defined. In the futures business, the rules are somewhat more flexible and, in some areas, downright vague.

Minimum margins are set and changed by the exchanges in response to volatility, but there is no consistent formula for establishing them. In the event of substantial impairment, additional margin must be deposited, but it is not always clear how long the client has to deposit funds or what happens if she does not. As a result the stage is set for many kinds of conflicts. If margin is demanded without justification or too quickly, the client may be forced out of a position which will then, of course, immediately move in her favor. If margin should have been collected but was not, the position seemingly will inevitably continue to move against the client, who will now maintain that she should not have been permitted to remain in the market and was therefore further damaged by not being forced out.

Day trading creates an especially interesting problem because exchange clearinghouses compute margins only at the close of the trading day, so under exchange rules at least, the day-trading customer has no obligation to deposit anything except the amount of any losses incurred. Although brokers appreciate the commissions being generated on little or no capital, they are aware that a customer who day-trades might one day move too slowly to exit a market before it closes or, worse, be trapped by an adverse limit move. In order to assure liquidity and good faith on the part of the customer, most brokerage firms have a requirement that the original margin for day trades be deposited in whole or in part, even though the trades are opened and closed out on the same day. The amount of the requirement varies widely from firm to firm, and the strictness of the enforcement of this rule against active accounts varies even more.

Disputes involving margin are almost impossible to prevent under present conditions, but they could be reduced somewhat by careful training of sales representatives, rigid supervision practices, and the enforcement of such rules as there are. A client should certainly have some idea of whether he is going to have to deposit funds, and if he has to, he should know by when and in what form. He should not have a position unreasonably liquidated despite the right given brokerage houses by most account agreements to liquidate when they feel the need to do so. Although he is not assured of being notified of liquidation in advance, he should be certain that once a liquidation is threatened, it is carried out to whatever degree necessary and is done when it is supposed to be done.

Some customers become quite perturbed when exchanges raise margin requirements retroactively or when an undermargined account must be restored not just to its maintenance level but to its full original level. The first of these, however, is not unusual, and the latter is universal.

Dealing with Irreconcilable Differences

Regardless of the effort made by a brokerage house in selecting, training, and supervising its sales representatives, disputes in the futures business will continue. Good practices and precautions can eliminate some problems and reduce the amount of exposure in others, but so long as some people, brokerage house employees and customers alike, make mistakes or are dishonest, disputes will happen.

A summary of what each side should consider doing or not doing in case of a conflict might be helpful.

The Complaint A client who thinks he has been wronged usually complains first to his sales representative, who usually, but not always, reports the problem to his supervisor. Sometimes, however, the broker himself is aware that he himself has caused the problem, in which case he might make every effort to avoid reporting the problem to anyone. In such cases, the broker might try to lull the customer by assuring him of better days ahead. This presents considerable danger to the customer, who might be told later that he has given up his rights by ratifying the actions of the broker. Ratification usually means that a client was wronged but waited too long to act after he became aware of a problem and understood that he was wronged; it is said that he gave up his rights by knowingly accepting the situation. Brokers, of course, are quite aware that some clients tend to accept bad situations temporarily to see how matters develop, meanwhile planning to act only if matters get worse. This, of course, is unfair to the broker, who will correctly maintain that the customer was obligated to mitigate damage by complaining promptly upon learning of and understanding any alleged mistreatment.

If the broker does as he should and reports to his supervisor, he should be required to submit a detailed written report of his view of what transpired as quickly as possible. From the firm's standpoint, this has many benefits. The story is complete and timely if the sales representative is forthright. It also protects the firm in the event that the sales representative leaves the firm under unfriendly circumstances, has a memory shorter than that of the client, or becomes physically or mentally incapacitated, possibly by being attacked by the client. It might prove wise for the firm to ask that the sales representative's narrative be addressed to the firm's attorney or to a member of its legal department who is an attorney in good standing. This will assure that the document will be considered a privileged communication.

Many disputes can be settled by or through the firm's local management. In many cases, enough goodwill can be retained to allow retention of the customer's account. If a customer senses that a dispute will require formal legal action, she should beware of continuing to deal with the same firm and especially with the same sales representative because of the danger that she will later be deemed to have ratified the situation and thereby be estopped from pursuing her case.

Legal Action If a complaint to management does not get results, a customer may well next call in an attorney. Although there is all too often no winner of a dispute past this point aside from the attorney, there are few alternative actions open to a customer. As is usually the case, except when a small claim is involved, expert help is almost certainly needed if the customer is to prevail. If an attorney has now entered the fray, and if the client chose the attorney more wisely than she chose her broker, neither should need this book for help past that point, but it might be useful to close with a brief summary of where matters may go next.

The Formal Demand The client who engages an attorney will tell him the events that led to his problem with the broker and negotiate an arrangement with the lawyer. This might involve the payment of fees based on time or a payment contingent upon results plus expenses. Specifics depend upon such factors as the quality of the case, the quality of the attorney, and the negotiating power of the parties. If the customer has lost enough money, of course, the contingency arrangement might be the only route open to him. This may still leave a problem having to do with the necessary expenses that are likely to be incurred. An established attorney with faith in his ability might be willing to deal with or even enthusiastic about a contingency arrangement in a major dispute, but he might be less enthusiastic about spending his own money.

Typically the first step taken by the attorney is to send a formal demand letter to the brokerage house threatening action by a given date if satisfaction is not provided. The brokerage house might respond with an offer or not respond at all, but usually it will have its own attorney or in-house counsel answer the letter denying any wrongdoing. It will hope that the client will then drop the matter, run out of money, or get hit by a meteorite. The brokerage house might also be convinced, and perhaps be correct in its conviction, that it really was in the right and that the client has been afflicted by a heavy diet of sour grapes. Usually the client pursues the matter.

The Arenas Basically, the client, advised by his attorney, will select arbitration, reparations, or a court to make his claim. Sometimes, the account papers that a client signed with the brokerage house limit the client's choices in the matter.

His choice of the arena should be carefully discussed with his attorney. There may be considerable differences in cost, the time required to wait for a hearing, and the amount that may be collected. This decision must not be made lightly.

The laws, rules, or regulations deemed to have been violated may affect the arena chosen for hearing the dispute. There are federal laws resulting from the Commodity Exchange Act of 1922 and the CFTC Act of 1974. There are many federal securities laws which attorneys sometimes attempt to utilize in commodity cases. The rules of the exchanges are said to have the force of law, as is trade custom. Common law may be invoked to establish breach of fiduciary duty or fraud. The various states also have laws which may be applied to commodities cases. And individual brokerage houses may even be taken to task for failing to enforce their own rules. Although there is no private right of action for the latter, probably because this would encourage brokerage houses to have no rules, failure to follow rules might well be considered substandard to trade custom.

The CFTC has a reparations procedure which is relatively inexpensive and has a reputation for fairness to both parties. With the small number of administrative judges, however, there is often a large backlog of cases, so the concept of a rapid hearing of disputes has not worked as well as had been hoped. The limited budget allocated to the CFTC has also reduced the ability of the judges to travel extensively, so clients may be forced to pay considerable travel costs for themselves, attorneys, and witnesses.

Some of these problems may be alleviated by the use of arbitration. Arbitrators may be provided by futures or stock exchanges, the National Association of Securities Dealers, the National Futures Association, the American Arbitration Association, or a court. There are said to be material differences among these in costs and waiting times and perhaps even different degrees of possible bias. Generally, however, arbitration may be arranged quickly at a reasonable cost, and a decision in good faith may be expected relatively soon.

If the positions of the opposing parties are not too far apart, a dispute may be decided by a mediator. This often results in a rapid and fair settlement that is far less costly than arbitration.

If a court trial is chosen, it must be determined whether a state or federal court will be used. This depends largely upon which rules or laws cover the major allegations, although the geographic location of the court may also be a consideration. Major disputes tend to reach a court, especially if the customer is seeking punitive damages. Such actions tend to be the slowest and most expensive, and they place the most stress upon the parties, but alas, even here, risk and reward, as always, seem to go hand in hand.

NOTES FROM A TRADER

It is rare for either a customer or his or her broker to emerge from a dispute with a profit, and engaging in disputes is not the most rewarding use of one's time anyhow. It would appear best for both parties to avoid trouble in the first place. But how? Herewith some ideas for the customer and the broker to think about.

The Customer

Patronize a reputable brokerage house. Select a registered commodity representative with scruples as well as sophistication. There is no need to hurry into the market. It will reopen on the next trading day. Read all documents carefully before signing them. If anything is unclear, ask questions. Sign nothing in blank. Ask for copies and preserve them. If representations are made, take notes. Date them and preserve them too. Read confirmations and statements. If they are not accurate, complain promptly in writing and keep a copy of your complaint. If you have decided to give your registered representative a power of attorney to use discretion in your account, you may wish to reconsider. If you selected your broker wisely, you should not need an attorney, but if you do, get a good one. Let the recent law school graduate practice on someone else. You have trouble enough.

The Broker

Your firm has or should have a compliance manual. It has practices that are recommended probably because of the bitter experiences of someone else. Follow its rules and guidelines. Complete new-account forms fully and carefully, and make sure that they are understood by the client. Give the client copies. If you make representations and have some feeling that the client is hearing only about the rewards and not the risks, write the client a letter summarizing what was said. The word "risk" and its synonyms should be mentioned more often than the word "reward" and its synonyms. Keep a copy. If you hate to spend time keeping a calendar, customer and position records, and a telephone log, keep them anyhow. Do not avoid a customer or the margin department when the markets are mistreating you. If there is trouble, hope that it was not caused by you, but whether it was or not, tell your superiors about it immediately. They know all about the rampant disease called "Buyer's Remorse" and will justifiably have little sympathy for a sales representative who causes problems and much less for one who magnifies them by attempting to conceal them. Full disclosure, honest representations, and a paper trail prevent most problems with clients whose memories might prove to be otherwise unduly flexible. Taking formal discretion over an account may seem efficient, but it establishes broker control of the account. If money is lost, this can cause trouble.

Further your affiant saith not.

PART FIVE

CHOOSING THE GAME—MARKETS

To profit from using the futures and futures options markets, speculators must know, in general, how the markets operate, the regulations surrounding these markets, general methods for analyzing the markets, and how to monitor their investments. Speculators must also know something about the specific market in which they are investing, whether beans, bonds, bellies, or bills. That is, in the final analysis, the decision-making process, or playing the game, eventually extends to the individual futures contract in which a commitment is to be made. Because the factors that affect the prices of copper and corn, for example, are nearly independent, there is good reason to employ the term "markets for futures" rather than "the futures market." Chapters 14 through 19 describe and analyze the active futures contracts. Basically, each future is discussed within a common framework, which includes the supply, utilization, price determinants, and futures contracts of each market. Futures contracts are generally grouped by their general type along with other futures contracts of the same type. The information given, although not exhaustive, provides the trader or broker with a good grasp of the significant elements that affect prices. It is important to note that different techniques may be illustrated in different chapters for individual commodities; however, the technique for one commodity is transferable to the others. For example, the regression analyses applied to cocoa, gold, and stock index futures should not be viewed as unique to those commodities.

There is a "Sources of Information" section for each specific futures contract. In addition, Chapter 15, "General Sources of Information," provides a summary of the general sources of information that apply to several or all futures contracts.

The specific groups of futures contracts discussed are:

The Interest Rate Futures Markets (Chapter 15)
The Foreign Currency Futures Market (Chapter 16)
Grains and Oilseeds (Chapter 17)
The Meat Futures Contracts (Chapter 18)
Precious and Industrial Metals (Chapter 19)
The Energy Markets (Chapter 20)
The Food, Fiber, and Wood Products Markets (Chapter 21)
Index-based Futures Markets (Chapter 22)

14

CHAPTER

General Sources of Information

> "A great part of the information I have was acquired by looking up something and finding something else along the way."
>
> —*Franklin P. Adams*

Information is a potent weapon in the futures game. Innumerable sources of commodity-related data are available from publications, government agencies, and the Internet. Our objective is to provide a guide for those interested in expanding their knowledge of futures by citing the most reputable (unbiased) sources of information. Most of the Internet sites can be reached directly through the following website:

www.Bornhoftgroup.com/futuresgame/

PERIODICALS

Daily newspapers can be a valuable and timely source of information. *The Wall Street Journal,* in addition to daily price data, provides market commentary and interpretation in its regular "Futures Markets" column. Subscribers to the *Journal* can also access its website (www.wsj.com), which allows users to search by topic on a wide range of subjects. Another useful publication is the *Investors Business Daily.* IBD follows all commodity markets and offers readers interested in technical analysis an impressive charting section that shows recent price history for the most active futures markets.

Futures Magazine is an excellent source of information on the managed money aspect of the futures industry. The magazine also features articles on individual markets, trading techniques, and current changes in the regulatory environment. *Futures* also sponsors an excellent website (www.futuresmag.com). *Stocks and Commodities* (www.traders.com) is an invaluable guide for those interested in both basic and advanced techniques of technical analysis.

The Commodity Research Bureau (Jersey City, N.J.) provides statistics and charts for most commodities as well as its widely accepted indicator of the commodity markets, the CRB Index.

Commodity Yearbook, an annual publication, is an invaluable reference which contains considerable data and also reviews developments in production, demand, international trade, government policies, and futures trading related to all commodities and financial assets underlying futures contracts over recent history.

An excellent journal devoted to the futures markets, *The Journal of Futures Markets* (John Wiley & Sons, Center for the Study of Futures Markets, Columbia University, New York), publishes both practical and theoretical articles on the futures and options markets. The journal provides a valuable meeting place for academics and practitioners. The Center for the Study of Futures Markets at Columbia University provides special academic research reports on various aspects of the futures and options markets.

General encyclopedias also provide excellent discussions of the nature of supply and production and utilization of various commodities.

HISTORICAL AND REAL-TIME PRICE DATA

Those who wish to perform research using futures price data face a unique challenge: the limited life span of futures contracts. Unlike the equities market, where a given stock is represented by a single price series, futures data are represented by a string of expiring contracts. For long-term analysis, analysts may find supplementing standard near-by futures contracts with continuous data (futures prices that are back-adjusted to represent the behavior of the most active contract)[1] useful. Numerous vendors can sup-

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[1] Jack Schwager, "Selecting The Best Futures for Computer Testing," *Stocks and Commodities Magazine* **10** (1992), 65–71.

ply both types of data. The larger historical data providers include Pinnacle Data Corporation, Commodity Systems, Inc. (CSI), S&P Comstock, and Tick Data, Inc.

Traders who require intraday price information can choose from dozens of sources. Users of "real-time" quotes must pay fees levied by the exchanges. These fees often equal the monthly fees charged by the quote providers (expect to pay $400 to $800 for real-time quotes). Exchange fees can be avoided by using quotes that are delayed (usually by about 15 minutes). Quote providers include Bonneville, CQG, PC Quote, Knight-Ridder, and DBC Signal.

TRADING AND RESEARCH SOFTWARE

Once the appropriate price data are acquired, specially designed software is available to create both fundamental and technically driven price forecasting. Among the most popular software products are the programs available from Omega Research, Inc. (Tradestation, Optionstation, and Supercharts). Metastock from Equis International is also a popular package. More advanced mathematical applications can be created with Mathematica (from Wolfram Research) and Visual Numerics (from Visual Numerics, Inc.). Logical Information Machines, Inc., offers a high-tech program that can be leased on a monthly basis.

BOOKS

A number of books on futures-related topics are published each year, and a number of companies specialize in trading books. Traders Press, Inc. (800-927-8222, www.traderspress.com), which has been in existence for over 20 years, offers both current selections and an extensive inventory of old and out-of-print books.

GOVERNMENT AND REGULATORY AGENCIES

Many government agencies, such as the U.S. Department of Agriculture, the Board of Governors of the Federal Reserve System, and the Securities and Exchange Commission, provide publications on specific futures markets. (Many of these publications are mentioned in the following five chapters on specific futures contracts.) Most of these publications are available from the U.S. Government Printing Office, Washington, D.C. 20401. This section considers only general publications on the futures markets.

The following lists of U.S. government commodity and crop reports are arranged by commodity and show the approximate dates of release:

U.S. Grains

1. Stocks in all positions, all grains—quarterly, about the 22d of January, April, June, October (soybeans excluded in October)
2. Planting intentions, spring crops—January 22 and April 15
3. Winter wheat production—monthly, May 10 through October 10
4. Rye production—monthly, July 10 through August 10
5. Oats, barley production—monthly, July 10 through September 10
6. Corn and sorghum grain production—monthly, July 10 through November 10
7. Acreage and production, next winter wheat crop—December 22
8. Annual summary for all crops other than small grains, final estimates of acreage, yield, production, price, and value—January 15

U.S. Oilseeds

1. Stocks in all positions, soybeans and flaxseed—22d of January, April, June, September
2. Planting intentions, soybeans and flaxseed—January 21 and April 15
3. Cottonseed output for previous season—May 10
4. Flaxseed production—monthly, August 10 through October 10
5. Soybean acreage planted and for harvest—August 12
6. Soybean and peanut production—monthly, August 10 through November 10
7. Soybean and cottonseed crush, stocks of beans, cottonseed, oils, and meal at mills—monthly, about the 25th
8. Annual summary, all oilseeds, production, yield—January 15

U.S. Cotton

1. Annual summary, acreage, production of previous crop—May 10
2. Farmer intentions to plant—January 21 and April 15
3. New-crop acreage—June 28

The following lists of U.S. government commodity and crop reports are arranged by commodity and show the approximate dates of release:

U.S. Grains

1. Stocks in all positions, all grains—quarterly, about the 22d of January, April, June, October (soybeans excluded in October)
2. Planting intentions, spring crops—January 22 and April 15
3. Winter wheat production—monthly, May 10 through October 10
4. Rye production—monthly, July 10 through August 10
5. Oats, barley production—monthly, July 10 through September 10
6. Corn and sorghum grain production—monthly, July 10 through November 10
7. Acreage and production, next winter wheat crop—December 22
8. Annual summary for all crops other than small grains, final estimates of acreage, yield, production, price, and value—January 15

U.S. Oilseeds

1. Stocks in all positions, soybeans and flaxseed—22d of January, April, June, September
2. Planting intentions, soybeans and flaxseed—January 21 and April 15
3. Cottonseed output for previous season—May 10
4. Flaxseed production—monthly, August 10 through October 10
5. Soybean acreage planted and for harvest—August 12
6. Soybean and peanut production—monthly, August 10 through November 10
7. Soybean and cottonseed crush, stocks of beans, cottonseed, oils, and meal at mills—monthly, about the 25th
8. Annual summary, all oilseeds, production, yield—January 15

U.S. Cotton

1. Annual summary, acreage, production of previous crop—May 10
2. Farmer intentions to plant—January 21 and April 15
3. New-crop acreage—June 28

The following lists of U.S. government commodity and crop reports are arranged by commodity and show the approximate dates of release:

U.S. Grains

1. Stocks in all positions, all grains—quarterly, about the 22d of January, April, June, October (soybeans excluded in October)
2. Planting intentions, spring crops—January 22 and April 15
3. Winter wheat production—monthly, May 10 through October 10
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5. Oats, barley production—monthly, July 10 through September 10
6. Corn and sorghum grain production—monthly, July 10 through November 10
7. Acreage and production, next winter wheat crop—December 22
8. Annual summary for all crops other than small grains, final estimates of acreage, yield, production, price, and value—January 15

U.S. Oilseeds

1. Stocks in all positions, soybeans and flaxseed—22d of January, April, June, September
2. Planting intentions, soybeans and flaxseed—January 21 and April 15
3. Cottonseed output for previous season—May 10
4. Flaxseed production—monthly, August 10 through October 10
5. Soybean acreage planted and for harvest—August 12
6. Soybean and peanut production—monthly, August 10 through November 10
7. Soybean and cottonseed crush, stocks of beans, cottonseed, oils, and meal at mills—monthly, about the 25th
8. Annual summary, all oilseeds, production, yield—January 15

U.S. Cotton

1. Annual summary, acreage, production of previous crop—May 10
2. Farmer intentions to plant—January 21 and April 15
3. New-crop acreage—June 28

4. Production estimates—monthly, August 10 through January 10
5. Ginning reports—biweekly, August through March on the 10th and the 24th
6. Consumption stocks—Census Bureau, monthly, about the 20th
7. Cotton statistics, annual bulletin—June 25

U.S. Livestock

1. Cattle and calves on feed—monthly, with key reports quarterly on January 20, April 16, July 19, and October 19
2. Calf crop, last year—February 2
3. Calf crop, current year—July 26
4. Sows farrowing and hog numbers—March 22, June 22, September 22, and December 22
5. Spring pig crop and fall farrowing—June 22
6. Fall pig crop and spring farrowing—December 22
7. Livestock slaughter—monthly, about the 29th
8. Poultry production and hatch—monthly, about the 20th

World Acreage and Production Reports by Country

Formerly issued about the end of each month in the following sequences, and now issued on an irregular basis:

January: wheat, rye, fats and oils
February: cotton, flaxseed, cocoa
March: soybeans, wheat, rye, corn, barley, oats, coffee
April: olive oil, hog numbers, cattle numbers, sheep numbers
May: cotton, cottonseed, lard, tallow and grease, peanuts
June: corn, sugar, coffee, hides
July: citrus, sunflower seed
August: wool
September: wheat and rye (world), barley, oats, coffees, fats and oils, corn (northern hemisphere)
October: cotton, cottonseed, soybeans, cocoa
November: flaxseed, peanuts, sugar
December: cocoa, coffee, olive oil, rapeseed

The Commodity Futures Trading Commission (CFTC) was formed by Congress in 1974 to regulate the trading of futures contracts, options on futures contracts, and options on physical commodities on all U.S. futures exchanges. Among the CFTC's responsibilities are monitoring the futures and options markets to detect and prevent price distortions and market manipulations and protecting the rights of customers of these markets.

The CFTC provides several regularly published periodicals and special reports. Among its periodicals are its quarterly CFTC report and its *Commitments of Traders Report,* which provides open interest in futures contracts by several categories, including commercial hedgers and speculators. It also publishes an annual report, which provides data and commentary.

Among the other CFTC publications are:

Large Hedger Study
Interagency Study of Futures and Options
Insider Trading Study
Ten-Year History of the Commission
A Spotter's Guide to Commodity Fraud
Basic Facts about Commodity Futures Trading
Before Trading Commodities—Get the Facts
Commodity Futures Trading Commission
Do's and Don'ts about Dealing in Commodities, Fowler West, commissioner, December 1983
Economic Purposes of Futures Trading
Futures Trading in Financial Instruments, Ronald B. Hobson, October 1978
Glossary of Trading Terms
Questions and Answers about How You Can Resolve a Commodity Market-Related Dispute
Survey of Interest-Rate Futures Markets, Naomi L. Jaffee and Ronald B. Hobson, December 1979

The National Futures Association (NFA) is the industrywide self-regulatory body of the futures industry. The primary purpose of the NFA is to assume, through self-regulation, high standards of professional conduct and financial responsibility on the part of the individuals, firms, and organizations that are its members. The NFA was designated as a registered futures association by the CFTC on September 22, 1981, and began operating on October 1, 1982.

The publications of the NFA reflect its charter. Among these publications are:

An Introduction to the National Futures Association

News Facts Actions, a quarterly publication (February, May, August, and November) which discusses various regulatory issues

Annual Review, published annually

Arbitration: A Way to Resolve Futures Related Disputes

The Need for a Coordinated Campaign against Commodity Fraud

A Compliance Guide: Introducing Brokers

An Application Guide: NFA Membership and CFTC Registration

A Compliance Guide: Commodity Pool Operators and Commodity Trading Advisors

Before You Say Yes—15 Questions to Turn Off an Investment Swindler

These and other NFA publications can be obtained from the National Futures Association, 200 West Madison Street, Suite 1600, Chicago, Illinois 60606.

Finally, the Futures Industry Association (FIA), the futures industry trade association, provides several useful publications. Statistically, the FIA *Monthly Volume Report, Open Interest Report, Monthly Options Report,* and *International Report* provide trading volume and open interest data for all futures and options contracts on a monthly basis. The FIA weekly bulletins provide a collection of general articles on the futures markets. The FIA *Congressional Report* discusses congressional issues related to the futures and options markets. The FIA also publishes a monthly newsletter, its *Report,* which provides data and discusses industry issues. An invaluable publication of the FIA is its *Futures Trading Course & Handbook,* which is published as a study guide to help those studying for the Registered Commodity Brokers (Series 3) examination, but is also useful as a general reference.

EXCHANGES

The various futures exchanges also provide publications on specific futures markets, which are mentioned in the appropriate following chapters, as well as general futures market publications. They are available on request.

The Chicago Board of Trade also publishes on an annual basis statistical annuals on each of its product groups which provide cash and futures market data on these products. The Chicago Mercantile Exchange publishes separate annual yearbooks for the Chicago Mercantile Exchange, the International Monetary Market, and the Index and Options Market.

Most of the exchanges listed maintain excellent websites, and some even offer free quote services on-line:

Bolsa Brasileira de Futuros (BBF)
Praca XV de Novembro, 20-5th Fl.
20010-010 Rio de Janeiro-RJ, Brazil
5521 + 271-1086; FAX 5521 + 224-5718
www.bbf.com.br

Bolsa de Derivados do Porto (BDP)
Av. Da Boavista, n. 3433
4100 Porto, Portugal
351-2-618-58 58; FAX 351-2-618 55 66
bvp@telepac.pt

Chicago Board of Trade
141 W. Jackson Blvd.
Chicago, IL 60604
(800) THE-CBOT
www.cbot.com

Chicago Mercantile Exchange
30 S. Wacker Dr.
Chicago, IL 60606
(312) 930-1000
www.cme.com

Coffee, Sugar, & Cocoa Exchange, Inc.
4 World Trade Center
New York, NY 10048
(800) HEDGE-IT
www.csce.com

Deutsche Borse AG (DTB)
60284 Frankfurt (postal address)
60313 Frankfurt am Main, Germany
49 69 2101-4897
www.exchange.de

Hong Kong Futures Exchange
Suites 605–608, Asia Pacific Finance Tower
Citibank Plaza, 3 Garden Rd., Central, Hong Kong
852-2842-9333
www.hkfe.com

International Petroleum Exchange of London, Ltd.
International House, 1 St. Katherine's Way
London, England E1 9UN
44 171 481 0643
www.ipe.ik.com

Kansas City Board of Trade
4800 Main Street, Suite 303
Kansas City, MO 64112
(800) 821-5228
www.kcbt.com

London International Financial Futures & Options
Exchange
Cannon Bridge
London EC4R 3XX, England
44 171 623 0444
www.liffe.com

London Metal Exchange
56 Leadenhall Street
London EC3A 2BJ, England
44 171 264 5555
www.lme.co.uk

Marche a Terme International de France
115, Rue Reaumur
75083 Paris, France
33-1-40-28-82-82
www.matif.fr

MidAmerica Commodity Exchange
141 W. Jackson Blvd.
Chicago, IL 60604
(800) 572-3276
www.midam.com

Minneapolis Grain Exchange
400 S. 4th Street
Minneapolis, MN 55415
(800) 827-4746
www.mgex.com

New York Cotton Exchange
4 World Trade Center
New York, NY 10048
(800) NY-COTTON
www.nyce.com

New York Futures Exchange
4 World Trade Center
New York, NY 10048
(800) THE-NYFE
www.nyce.com

New York Mercantile Exchange
NYMEX division and COMEX division
4 World Trade Center
New York, NY 10048
(212) 748-3341
www.nymex.com

New Zealand Futures and Options Exchange Ltd.
P.O. Box 6734, Wellesley St.
Aukland, New Zealand
64-9-309-8308
www.nzfoe.co.nz

Philadelphia Board of Trade
1900 Market Street
Philadelphia, PA 19103
(800) 843-7459
www.phlx.com

Singapore Commodity Exchange
111 N. Bridge Rd., #23-04/05, Peninsula Plaza
Singapore 179098
65 338-5600
www.sicom.com.sg

Singapore International Monetary Exchange Ltd.
1 Raffles Place, #07-00 OUB Centre
Singapore 048616
65-535-7382
www.simex.com

Sydney Futures Exchange, Ltd.
30-32 Grosvenor St., Sydney, NSW 2000
Australia
61 2 9256-0555
www.sfe.com.au

Tokyo Commodity Exchange
14th Floor, Riverside Yomiuri Bldg.
36-2, Nihonbashi-Hakozakicho
Chuo-ku, Tokyo 103, Japan
813-3661-9191

Tokyo International Financial Futures Exchange
1-3-1 Marunouchi, Chiyoda-ku
Tokyo 100, Japan
81-3-5223-2415
www.tiffe.or.jp

Toronto Futures Exchange
Exchange Tower, 2 First Canadian Place
Toronto, Ont. M5X IJ2 Canada
(416) 947-4487

Warenterminborse Hannover AG
Rathenaustr. 2, D-30159 Hannover, Germany
49-511-32 76 61
e-mail: BurgWarvberg@T-online.de

Winnepeg Commodity Exchange
500 Commodity Exchange Tower
360 Main Street
Winnepeg, Manitoba Canada R3C 3Z4
(204) 925-5000
www.wce.mb.ce

THE INTERNET

One of the best sources for information on the futures industry is through the Internet. Countless websites are available on every aspect of the futures game. Some of the better sites that are offer information free of charge include the following:

Managed Money

Managed Funds Association	www.mfahome.com
Traderscan	www.traderscan.com
Investment News Online	www.ino.com

News

Associated Press Top 10 Headline Stories	www.abslive.com
Barrons'	www.barrons.com
Bloomberg Online News	www.bloomberg.com
CNBC Business News	www.cnbc.com

Government/Regulatory Agencies

Commodity Futures Trading Commission (CFTC)	www.cftc.gov
Futures Industry Association	www.fiafii.org
National Futures Association	www.futures.org
FedWorld	www.fedworld.gov

Fundamental Data Sources

Commitment of Traders Report	www.cftc.gov
Dept. of Agriculture Crop Data (Cornell U.)	mann77.mannlib.cornell.edu (gopher)
Agrigator (Univ. of Florida)	www.gnv.ifas.ufl.edu
Department of Commerce (U. of Michigan)	una.hh.lib.umich.edu (gopher)
Dr. Ed Yardeni's Economics Network	www.webcomm.com/~yardeni
Ohio State Economic Data Finder	www.cob.ohio-state.edu

Academic Research

Professor William F. Sharpe	www.stanford.edu
UIUC Office of Futures and Options Research	gopher.ag.uiuc.edu
Duke University's Futures and Options Research Center	www.duke.edu

NOTES FROM A TRADER—GENERAL SOURCES OF INFORMATION

Many traders trade without a system and correspondingly without information—they trade solely on the basis of instinct. This is a major reason why so many traders are losers. Having a valid system and supporting information does not guarantee trading success, but it may increase the possibility of success. Even so, good trading instincts are almost certainly indispensable.

There are many different sources of both fundamental and technical information, many of which are mentioned in this chapter. This information can be used in a formal model or in a very informal model. Typically, technical forecasting requires less data or information and a more formal model, while fundamental forecasting requires more data or information and a less formal model, although large formal fundamental models are also used by professional traders.

Data and information can help a trader avoid pitfalls and identify opportunities. Traders should develop their own sources of information and also expect useful information from their brokers.

15 CHAPTER

The Interest Rate Futures Market

"Interest is immeasurably better and more important than beauty."

—*G.K. Chesterton*

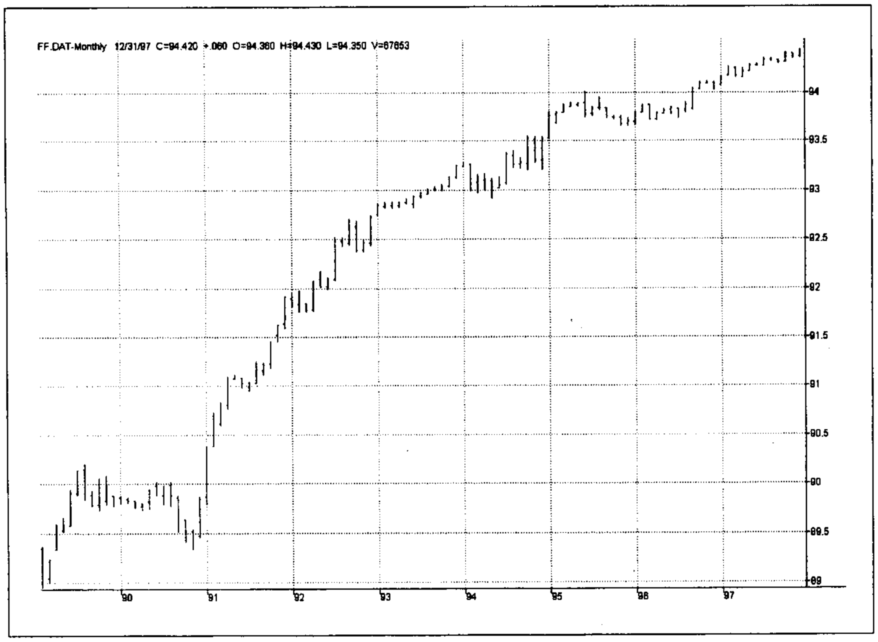
INTRODUCTION

Futures on interest rates, first introduced in 1975 by the Chicago Board of Trade, have grown to be the most liquid of all futures contracts. There are several reasons for their preeminence in the global marketplace. First, interest rate futures are not "tiered"—that is, the bid and offer prices are publicly disseminated and equally available to all market participants regardless of credit rating. Thus, a small company can implement a hedging strategy in the capital markets for the same cost as the most solid *Fortune* 500 corporation. If this same company wished to hedge its interest rate exposure via a private bank transaction, the strength of its balance sheet would determine the final cost.

Second, futures markets entail virtually no credit risk. Exchange trading is structured to protect all parties involved by the use of a clearinghouse. This entity acts as a de facto guarantor for both the buyer and seller. Thus, a company that uses the futures markets to hedge interest rate risk does not have to concern itself with the creditworthiness of the counterparty, since the clearing corporation guarantees both sides of the transaction against default.

FIGURE 15–1

Fed funds futures, 1989–1997. 100 – futures = Fed funds interest rate. Chart created using TradeStation 4.0 by Omega Research, Inc.



Third, dramatic interest rate shifts in the last decade have made hedging exposure almost a requirement for most companies (see Figure 15-1). The further maturation of global debt markets has made corporate borrowing easier than ever; the end result is that more publicly traded companies have issued more and more debt in the marketplace. The interest payments (which are frequently structured as floating-rate obligations) associated with that debt directly impact the profit margins of these companies. The ability to protect oneself from the fluctuations of interest rates is a major reason that hedging with interest rate futures has had such a dramatic impact on world derivative markets.

THE INTEREST RATE COMPLEX

Futures on interest rates run the gamut from short maturities (30-day Fed funds, T-bills and eurodollars) to midcurve contracts (2-, 5-, and 10-year futures on Treasury notes), to long-term maturities (30-year Treasury bond

EXHIBIT 15-1

U.S. Interest Rate Futures Contracts at Domestic Exchanges

Market	**Exchange**	**Contract Size**	**Maturity**
Fed funds	CBT	$5,000,000	30 days
Eurodollar	CME	$1,000,000	90 days
Treasury bill	CME	$1,000,000	90 days
Treasury notes:			
2-yr	CBT	$200,000	2 years
5-yr	CBT	$100,000	5 years
10-yr	CBT	$100,000	10 years
Treasury bond	CBT	$100,000	30 years

CBT = Chicago Board of Trade; CME = Chicago Mercantile Exchange. Most contracts trade at multiple exchanges. The exchanges listed represent the highest trading volume for the contract.

futures). Exhibit 15-1 details the available contracts on domestic exchanges rates.

PRICES AND DELIVERY MONTHS

Futures based on Treasury securities that trade on the Chicago Board of Trade reflect the price level at which the underlying securities trade. For instance, Treasury bonds for December delivery might be quoted at a price of 110-08, which is translated to 110 $\frac{8}{32}$ per $100,000 face amount, or $110,250. Futures based on short-term interest rates are traded using a price index, which is derived by subtracting the future's interest rate from 100.00. For instance, an interest rate of 6.00 percent translates to an index price of 94.00 (100.00 – 6.00 = 94.00).

Most of the short-term rate futures feature a minimum price move of 0.01. Gains or losses are calculated by determining the number of ticks moved, multiplied by the dollar value of the tick. The CME's euroyen and Mexican interest rate contracts are similarly traded, but the gains and losses are realized in Japanese yen and Mexican pesos, respectively.

All interest rate futures on the CBOT are traded on a quarterly schedule—delivery months are March, June, September, and December. Eurodollar and Fed funds contracts are listed for all calendar months.

SUPPLY

The Department of the Treasury holds regularly scheduled auctions for U.S. debt instruments according to their maturity: 3- and 6-month Treasury bills are auctioned each Monday of the calendar year; 2- and 5-year notes are usually auctioned during the third week of each month; 3- and 10-year notes are auctioned in February, August, May, and November; 30-year bonds are auctioned in February, August, and November.

The Treasury uses two types of auctions. In a *regular auction,* bids are filled lowest to highest (the lowest interest rate bid is filled first, until the auction amount is sold). Bills, 3-years, 10-years, and 30-year bonds are auctioned in this manner. In a *dutch auction,* all bids are filled at the lowest interest rate; 2- and 5-year notes are auctioned according to the dutch method.

DEMAND

Many different types of investors buy Treasury securities. Short-term instruments are bought by banks, the general public, and other conservative investors. Long-term instruments (10-year notes and 30-year bonds) are purchased mainly by foreign central banks and insurance companies. The governments of Saudi Arabia and Japan are typically large purchasers during Treasury auctions.

DETERMINANTS OF INTEREST RATES

The prices of interest rate futures move inversely to the interest rates on these contracts in the same way that the prices and interest rates of all fixed-rate instruments move inversely. Specifically, if interest rates rise, prices fall, and vice versa. Thus, a long position in an interest rate futures contracts profits from decreasing interest rates (and increasing prices). A short position profits from rising interest rates (and lower prices).

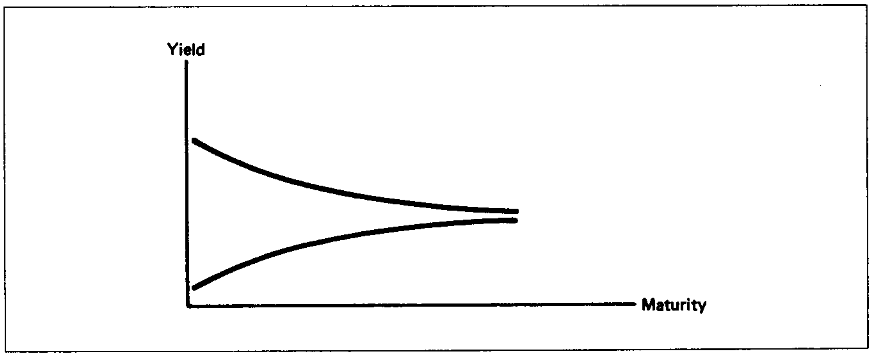
A fundamental concept in the interest rate markets is the yield curve. A yield curve shows the relationship between the yield and the maturity of fixed-income securities that are the same in every way except maturity. Yield curves are based on the interest rates of Treasury securities because the Treasury has debt outstanding for virtually all maturities.

When interest rates are stable, long-term interest rates (30-year maturity) are typically higher than short-term rates (90-day maturity), and the yield curve is "normal" or "positive", as shown by the bottom curve in Figure 15-2. Economists have attempted to explain why the yield curve is normally upward sloping; the bulk of their explanations assume that since most investors prefer to invest in short-term instruments, the return on those investments should be lower than those of longer maturities. This is known as the *liquidity preference theory.* However, on some occasions (usually accompanied by high inflation and high interest rates) short-term rates are higher than long-term rates. This is known as an "inverted" yield curve, and is shown as the top curve in Figure 15-2. Such a curve is hard to fathom: What situation would cause investors to prefer long-term bonds over T-bill? This situation is better explained by a competing theory called the *pure expectations hypothesis* (PEH), which states that the shape of the yield curve is determined by expectations of future rates. If market participants expect long-term rates to decline (due perhaps to the end of an inflationary period in the economy), short-term rates would be high relative to bond yields.

From Figure 15-2 it should be clear that short-term rates usually change by more over the interest rate cycle than long-term rates; that is, short-term rates are more volatile. However, given equal yield changes, the price of a long-term instrument changes by more than the price of a short-term instrument. For example, if the interest rates of $1 million of 90-day Treasury bills and 30-year Treasury bonds increased from 12 percent to 12½ percent (or by 50 basis points, each 0.01 percent being 1 basis point), the price of the 90-day bill would decrease by $1250 and the price of the

FIGURE 15-2

Yield curves.



bond by $38,947. Because of this price response to yield changes, even though short-term interest rates are more volatile over the interest rate cycle, long-term prices are more volatile.[1] Because of these differences, price forecasters usually distinguish between forecasting short-term and long-term interest rates.

Several types of indicators are used to forecast interest rates. The most widely used indicator relates to monetary variables suggestive of the posture of the Board of Governors of the Federal Reserve System (the Fed) in conducting monetary policy. The Fed can cause interest rates to increase by enacting "tighter" monetary policy and cause interest rates to decrease by enacting a "easier" posture.

Many interest rates are watched to detect the Fed's influence on them, the most important being the Fed funds rate. This is the rate at which commercial banks lend to one another on an overnight basis. The Fed alters the supply of Fed funds by injecting money into the banking system, to keep the Fed funds rate around their "target rate." A high Fed funds rate is usually interpreted to mean that bank reserves are inadequate for the needs of the banking system and that Fed policy is, therefore, restrictive or "tight." A higher Fed funds rate is commonly employed to slow down an economy that is perceived to be growing too fast.

Because the strength of the economy affects interest rates, economic indicators are watched and analyzed to determine their effect on interest rates. Generally, evidence of a weak economy is bullish for interest rate markets, since a weaker economy is less likely to be met by Fed rate hikes. Among the economic variables that are closely watched are the following:

1. GDP growth
2. Index of Industrial Production
3. Retail sales
4. Unemployment
5. Index of Leading Indicators
6. The Consumer Price Index (CPI) and Producer Price Index (PPI)
7. Housing starts and new-home sales

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[1] The difference in volatility between long- and short-term instruments is why the denomination of the T-bill contract ($1 million) is 10 times larger than that of the T-bond contract ($100,000). Given this difference in denominations, the prices of both contracts tend to vary by approximately the same dollar amounts over the interest rate cycle.

8. Retail and auto sales
9. Durable goods orders and construction spending

Interest rate forecasters analyze economic variables in several different ways. Some construct complex econometric models, which incorporate the relationships in the form of mathematical equations, to determine which indicators are most important. Others simply mentally digest all these variables and produce a less systematic forecast. Still others rely solely on technical analysis.

HEDGE USES

Interest rate futures can be used to hedge against an existing interest rate risk. The three most often encountered hedging strategies are the long hedge, the short hedge, and the duration-adjusted hedge. Futures are also commonly used to adjust the asset allocation of a portfolio.

The Long Hedge

Long-hedge strategies are typically used by investment managers and other "buy-side" professionals. Suppose the manager of a bond portfolio owns a position in an issue of 10-year Treasury notes that are due to expire in a week. He is anxious to reinvest the proceeds in another position as soon as possible, as the falling interest environment is pressuring prices of similar notes higher. The manager has two choices: wait until the position matures and invest the capital at that time, hoping that prices will stall out or decline, or buy an amount of 10-year note futures that would represent his future purchase, thereby profiting if prices rise between now and the maturity date of the expiring position. If the manager owed $1 million of the maturing notes, he would buy 10 contracts:

$$\frac{\$1{,}000{,}000}{\$100{,}000 \text{ (value of contract)}} = 10 \text{ contracts}$$

Using a long hedge, the profits from the long futures position would offset the additional amount the manager would have to pay in the cash market. Of course, if interest rates increased in the interim, the futures losses would be equal to any cost savings the manager realizes by repurchasing her or his note position. Thus, the manager is "locking in" an interest rate in this strategy—regardless of the direction of interest rates in the next week, the manager knows exactly how much the effective cost will be for the Treasury note position 1 week hence.

The Short Hedge

Investment managers also turn to the futures markets to protect their holdings against the risk of rising interest rates. The ability to easily and cost-effectively establish a short position makes futures especially valuable for this purpose. The hedger first examines the interest rate risk faced by the securities held in the portfolio. If warranted, a full hedge can be implemented, in which the price changes in the cash market are completely offset by a corresponding position in the futures market, or a partial hedge, in which the potential price decline is only moderately offset.

The Duration-Adjusted Hedge

Finally, interest rate futures are frequently used to alter the duration of fixed-income portfolios. Duration is a measure of the interest rate sensitivity of a security and is measured in time (years). The duration of a pure discount bond (one that is bought at a discount and pays interest only upon maturity) is equal to its maturity; a bond of this type that matures in, say, 10 years has a duration of 10 years. But for a bond (like a Treasury bond) that pays periodic interest, its duration is always less than its maturity. Duration is directly proportional to a bond's maturity and inversely proportional to its coupon rate.

Given the price response of a particular futures contract to interest rate changes, futures can be bought or sold against the portfolio to replicate the price response of a portfolio with the desired duration. Hedging a portfolio by selling futures lowers its duration; a completely hedged portfolio lowers the duration to replicate the return of very short-term securities. Likewise, increasing the duration of a portfolio by buying futures can result in substantial gains (losses) in a falling (rising) interest rate environment. This is known as *dynamic hedging*.

It is important to note that a portfolio with a duration obtained using futures may differ from one of the same duration using cash securities. Nonparallel changes in the yield curve can have different effects on the two portfolios, because the futures contracts can either underperform or outperform similar duration cash securities, depending on the structure of the portfolio and the nature of the yield curve change. For example, if the long end of the market outperforms the short end, a portfolio that has been created by buying bond futures will outperform a cash portfolio of the same duration comprised of a mix of short-term securities.[2]

SPECULATIVE USES

The extreme liquidity of the domestic interest rate markets makes them a favorite for large (and small) speculators. By far the most common form of speculation is an outright position. Market participants betting on lower interest rates buy the appropriate futures contact; conversely, those that believe that rates are heading higher can establish a short position.

Another popular position is known as a *yield curve trade.* Referring again to Figure 15-2, a trader who believes that long-term rates would

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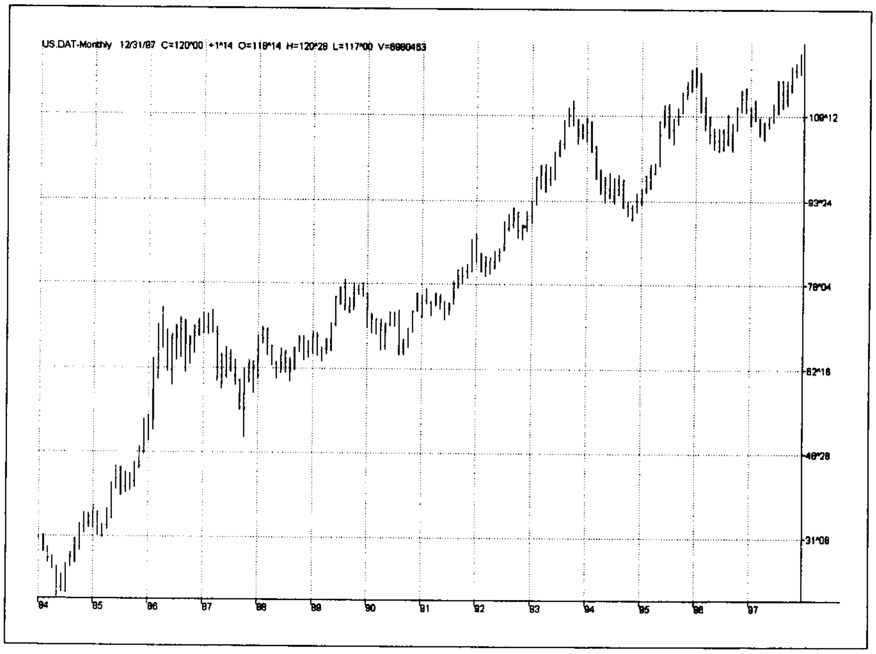
[2] An excellent source of information on hedging in the interest rate futures market is the Chicago Board of Trade's homepage. The address is www.cbot.com.

FIGURE 15–3

30-yr. Treasury bond futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



decline more than short-term rates could establish a spread trade composed of long T-bond futures and short T-bills (or eurodollars).

The recent histories of the three most active contracts—Treasury bonds, Treasury notes, and eurodollars—are shown as Figures 15-3 through 15-5.

ARBITRAGE STRATEGIES

Arbitrageurs (from the French *arbitrage,* meaning "to umpire") seek to profit from mispricings in capital markets. Arbitrage opportunities exist when an asset sells for two prices and can be purchased at the low of the two prices and sold at the high price simultaneously. Similarly, arbitrageurs use the futures markets to "lock in" an interest rate when a similar interest rate can be obtained at a different price. An example of such a trade would involve selling a 90-day T-bill futures contract and borrowing sufficient funds to buy a T-bill if the interest rate on the borrowed funds is

FIGURE 15-4

U.S. 10-yr note futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.

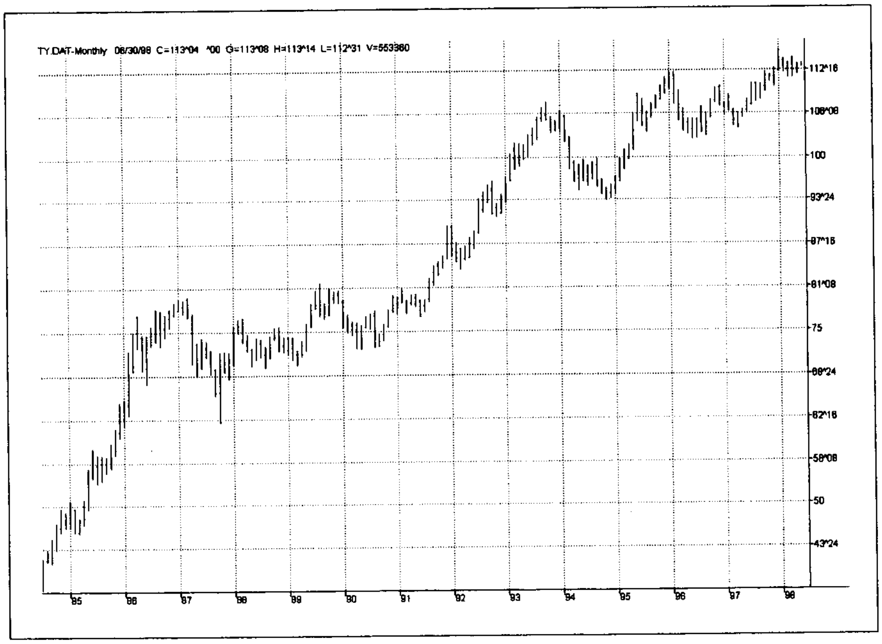
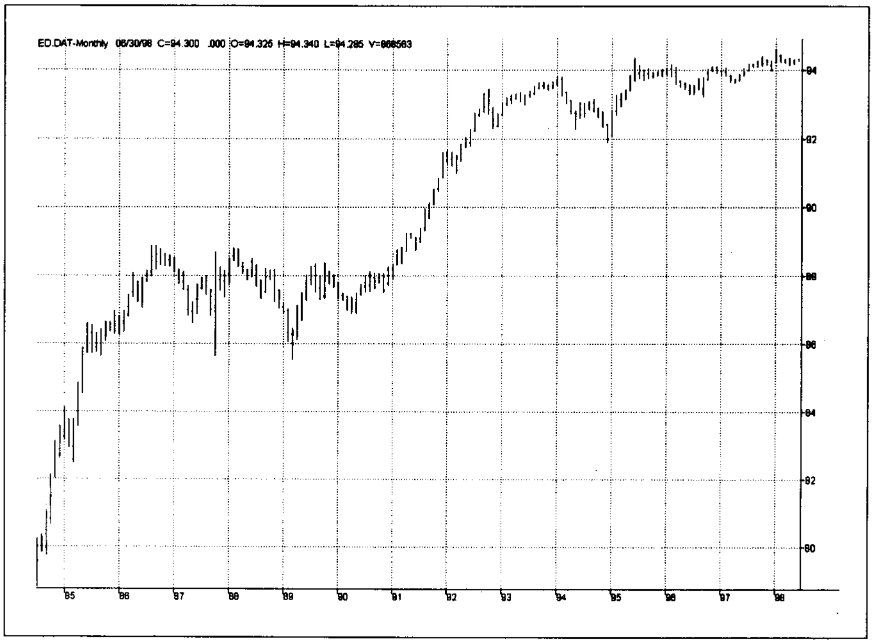


FIGURE 15-5

U.S. 90-day Eurodollar futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



less than the spread between the futures and cash transaction (such an interest rate is commonly referred to as the *implied repurchase rate.*[3] Trading of this type is extremely capital intensive and requires sophisticated computational expertise. The implementation of such strategies tends to eliminate interest rate differentials, thus making the markets more efficient.

NOTES FROM A TRADER

The interest rate futures markets have attracted great interest from fundamentalists and technicians. The former watch long-term trends, mainly

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[3] An excellent source of information on arbitrage in the interest rate market can be found in the classic text *Money Market Calculations: Yields, Break-Evens, and Arbitrage* by Marcia Stigum (Dow Jones Irwin, 1981).

with regard to inflation and economic growth, and short-term factors such as monthly employment figures, durable goods orders, and industrial production. Fed policy is the most important indicator; directional shifts in interest rate policy are always greatly anticipated.

Technicians watch how markets react to releases of new information for clues to future direction. Trend-following traders usually have a long-term perspective and point to the fact that Fed policy shifts rarely, thus allowing for exploitable trends. Contrarians tend to fade moves in these markets, selling new highs and buying lows in an effort to exploit short-term price moves.

The interest rate futures markets offers large institutions the opportunity to hedge interest rate risk. For speculators, these markets offer liquidity and depth—an order to buy or sell thousands of contracts can easily be absorbed. There is little wonder that the interest rate markets have become the most successful in the history of global derivatives.

16 CHAPTER

The Foreign Currency Futures Markets

"You never learn a trade thoroughly until you learn the tricks of the trade."

INTRODUCTION

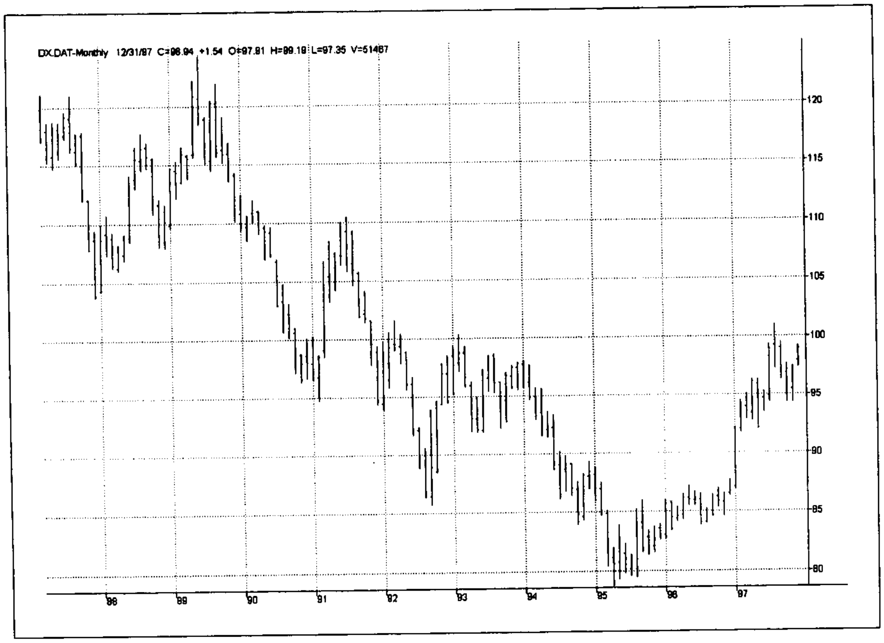
The era of modern financial futures markets began in May 1972, when the Chicago Mercantile Exchange began trading foreign currency futures. The collapse of the Smithsonian Agreement in March 1973, which ended the age of fixed-rate foreign exchange in favor of freely floating currencies, greatly contributed to the success of these markets. Figure 16-1 shows the value of the dollar in the last 10 years.

The listing of the foreign currency futures contracts was greeted with much skepticism. First, these were the first futures contracts listed on financial instruments, and many observers did not believe there could be successful futures trading on financial instruments. Second, there was and still is a well-developed bank forward market for foreign currencies, which many believed made the foreign currency futures markets unnecessary.

But today the foreign currency ("forex") futures markets are prospering and, indeed, are among the largest and fastest-growing futures mar-

FIGURE 16–1

U.S. dollar index futures, 1987–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



kets. Obviously, the foreign currency futures markets have filled a need. These markets have succeeded for several reasons.

First, the interbank forward markets are available only in fairly large denominations ($1 million and over), and only corporations which are good credit risks, mainly large corporations, have access to them. To such large users of deferred (futures or forward) foreign currency contracts, however, there are advantages of the interbank forward markets over the futures markets, and such users continue to use the bank forward markets. Some of the advantages of the bank forward markets are shown in Exhibit 16-1. For these reasons, large corporations which have access to the bank foreign currency forward markets continue to use them.

There are, however, some advantages of foreign currency futures markets over the bank forward markets. As indicated, the foreign exchange futures markets are available in smaller denominations and have lower credit standards. Also, once a foreign exchange forward contract has

EXHIBIT 16–1

Advantages of Foreign Currency Forward Markets over Futures Markets

	Forward Markets	Futures Markets
Forward dates	Available on any day.	Delivery days are one day per contract—contracts mature on a quarterly basis.
Amounts	Available in any amount.	Available in integral multiples of minimum dollar value of futures contract.
Transaction costs	Higher for relatively small amounts but lower for relatively large amounts.	Lower for relatively small amounts, but higher for relatively large amounts.
Related services	Foreign currency forward markets are often provided in conjunction with other bank services, such as consultation, and borrowing services.	Foreign currency futures markets are provided independently.

been established, it is difficult and expensive to liquidate this position before making or taking delivery of the foreign currency on the delivery day of the forward contract. With futures contracts, it is as easy and inexpensive to liquidate the position without making or taking delivery as it was to initially establish the position. Thus, it is much easier to trade or manage a position in the futures markets than in the forward markets.

Many small corporations and companies do not have access to the bank foreign currency forward markets. Neither do retail speculators. And these users, primarily retail speculators, were among the primary early users of the foreign currency futures markets. These markets had found a niche.

But the developers of the IMM and the foreign currency futures contracts formulated a procedure which made it easier for another important class of users to indirectly use the foreign currency futures contracts. This class of users consisted of the same banks that make the foreign currency forward markets. The procedure was class B arbitrage, an IMM policy which made banks confident about making their forward markets available to firms that arbitraged between the foreign currency futures and forward markets. This provided two important advantages for the forex (foreign currency) futures markets. The first advantage was additional trading volume and, thereby, increased liquidity. The second was appropriate pricing. Because of this arbitrage, the prices of the less liquid futures markets more accurately reflected the prices of the more liquid forward markets.

This innovation was crucial in the development of the foreign currency futures markets. Because of its success, class B arbitrage is no longer as common as it once was. The banks are now arbitraging the foreign currency forward markets against the futures markets directly, thereby earning the arbitrage profits themselves rather than letting the class B arbitrageurs earn the profits. And the futures markets have become more liquid, particularly late in the U.S. trading day after the European foreign exchange markets have closed, at which time the futures markets are often more liquid than the bank forward markets. The futures markets frequently lead the forward markets in price changes, even earlier in the day.

Another group of U.S. commercial firms that uses the forex futures markets is agricultural firms that arbitrage between the U.S. agricultural markets and foreign agricultural markets, mainly the European and Canadian markets. These firms, which must hedge their forex exposure as part of their overall arbitrage, often have floor presences on the major exchanges, including the IMM; thus they have better information and lower transaction costs in the forex futures markets than in the forward markets.

Today the forex futures markets are an integral component of the world's forex markets. But the forex futures markets became successful mainly due to speculators' use of these markets. And speculators remain the major users of these markets.

There is an important difference between the forex futures and forward markets for most foreign currencies, namely, the way in which prices are quoted. Forex futures prices are quoted in essentially the same way other futures prices are quoted, that is, in dollars or cents per unit of the underlying asset. Thus, for example, for the British pound, the futures price is quoted as $1.20 per British pound, and for the West German mark, the futures price is quoted as $0.40 per DM.

The bank forward markets quote prices for some foreign currencies in a different way. While the bank markets quote prices for the British pound, the Canadian dollar, and the Mexican peso the same way as the futures markets, the bank markets quote the prices of other foreign currencies in terms of the number of units of the foreign currency per U.S. dollar—that is, they use the reciprocal of the way in which prices are quoted in the futures markets. For example, if the price of the DM is quoted as \$0.40 per DM in the futures market, it will be quoted as 2.50 DM per U.S. dollar (1/0.40 = 2.50) in the bank market. Thus, speculators will have to make a simple calculation to convert bank rates to futures rates for these currencies.

AVAILABLE CONTRACTS

Futures on foreign currencies are traded at a number of U.S.-based exchanges. The most actively traded currencies are those based on countries that have the largest impact on the world economy—namely, German d-marks, Japanese yen, and British pounds. In recent years, however, increasing investment in emerging markets has facilitated the need for futures based on currencies of developing countries such as Mexico, Brazil, and South Africa. Other recent additions include cross-rate futures, in which participants can speculate on the value of one currency relative to another independent of the U.S. dollar (see Exhibit 16-2).

Currency futures expire quarterly, at March, June, August, and December. Options on futures are available for all 12 months of the calendar year.

DETERMINANTS OF EXCHANGE RATES

When exchange rates experience a significant move, virtually all aspects of international business are affected. If currency movements are extreme, the ability of domestic and foreign firms to maintain or improve profit margins is seriously compromised. Exchange rate movements can also have a profound impact on the investment decisions of international and fixed income and equity managers. According to Lee,[1] about 30 percent of the variability of foreign equity returns in U.S. dollar terms can be attributed to foreign exchange fluctuations, while over 60 percent of the variability of the returns of foreign bonds can be attributed to currency valuations.

With the accelerating trend toward international trade and investing, companies are paying more attention to the impact of currency risk on their portfolio returns. Thus, the determination of foreign exchange rates is of vital importance to all U.S. firms doing business overseas. Unfortunately, speculating on exchange rates is quite difficult. Economists have developed a variety of theories to explain how exchange rates are determined, but the

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[1] Adrian F. Lee, "Currency in International Investing," in *Strategic Currency Investing: Trading and Hedging in the Foreign Exchange Market,* ed. Andrew W. Giltin (Chicago: Probus, 1993).

EXHIBIT 16-2

Currency Futures Contracts at Domestic Exchanges

Market	Exchange	Contract Size
Australian dollar	CME	A$100,000
British pound	CME	62,500 British pounds
Canadian dollar	CME	C$100,000
Deutsche mark	CME	DM125,000
French franc	CBT	FF100,000
Japanese yen	CBT	$100,000
Swiss franc	CBT	$100,000
Mexican peso	CME	
Cross-rate futures		
Dmark/French franc	CTN	DM500,000
Dmark/Italian lira	CTN	DM250,000
Dmark/Swiss franc	CTN	DM125,000
Dmark/yen	CTN	DM125,000
Pound/dmark	CTN	125,000 British pounds
Index-based futures		
U.S. Dollar Index*	CTN	$1000 times index

Exchanges: CBT = Chicago Board of Trade; CME = Chicago Mercantile Exchange; CTN = New York Cotton Exchange. Most contracts trade at multiple exchanges. The exchanges listed represent the highest trading volume for the contract.

* The U.S. Dollar Index is based on a the dollar-based valuation of the following currencies: German mark, Japanese yen, French franc, British pound, Canadian dollar, Italian lira, Netherland guilder, Belgium franc, Swedish krona, and Swiss franc.

overwhelming body of evidence indicates that, although these theories are useful in describing long-run equilibrium levels, currency prices in the short- and medium-term are best characterized as random walks.[2]

Five of the major fundamental variables used in the determination of exchange rates are discussed below.

Purchasing Power Parity—the Law of One Price

The *purchasing power parity* (PPP) approach to currency valuation is probably the most widely used framework used by economists to describe long-term valuations of currencies. Simply, PPP states that currencies are

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[2] Michael R. Rosenburg, *Currency Forecasting* (Chicago: Irwin Professional Publishing, 1996), p. 2.

valued for what they will buy both at home and abroad. For example, if the cost of producing a bundle of goods in the United States was \$1000 and the cost of the same bundle was DM2,000, the exchange rate that would equalize the cost of purchasing the similar bundles of goods would be:

$$\frac{\text{DM}}{\text{US\$}} = \frac{\text{DM2,000}}{\text{US\$1000}} = 2.00$$

Thus, a 2 deutschmark to 1 dollar rate of exchange would equalize the cost of goods in both countries.

Like most economic theories, PPP is much easier to grasp in theory than to apply in practice. The biggest dilemma lies in the valuation of the "bundle of goods" used in the example above. Since national tastes and preferences can vary considerably, one good may be valued differently between countries. Fortunately, there is a relatively simple solution to this predicament. If one can comfortably *assume* that exchange rates follow a true PPP path, but that path is unknown, a long-run moving average of exchange rates may serve as a guide to the long-run equilibrium path of the exchange rate. The actual exchange rate will then "serpentine" around this estimated moving average trend.[3] This would lead traders to buy a currency when it reached a threshold level below its long-run moving average, and sell when it is a certain amount above its moving average (Figure 16-2).

Bilson proposed a similar trading strategy for the currency markets. His model bought currencies in downtrends, increasing its position until the currency returned to its long-term moving average. Such "scale-down buying" can be profitable but quite risky; if the currency's deviation from its PPP equilibrium is severe or permanent, the system could quickly wipe out a trading account.[4]

Balance of Payments

The balance of payments was originally a simple concept designed to measure for the United States the dollar outflows from the United States to foreign countries relative to the inflows of foreign currencies from foreign countries. But as the international financial flows have become more com-

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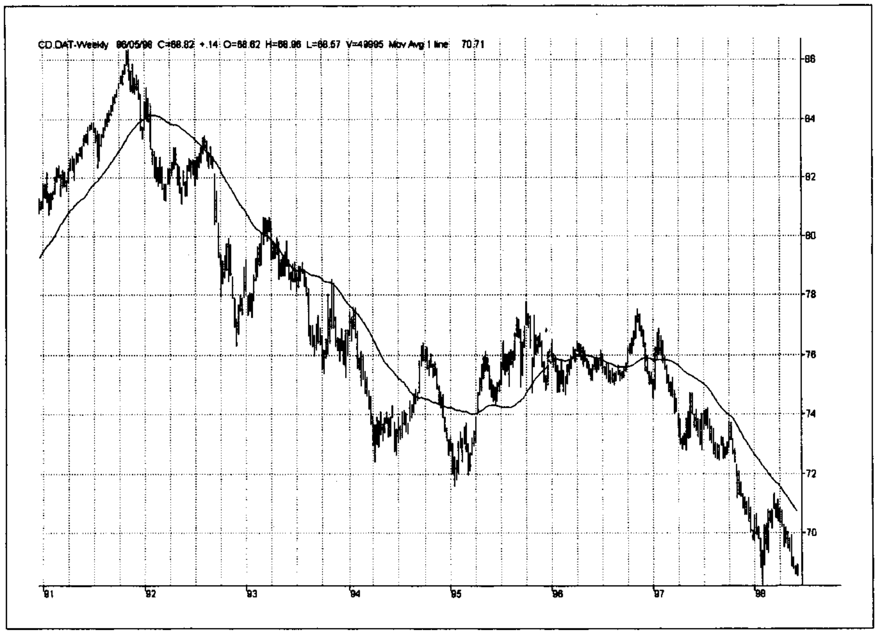
[3] Ibid., p. 17.

[4] John F. O. Bilson, "Purchasing Power Parity as a Trading Strategy," *Journal of Finance* **39**, no. 3 (July 1984), 715–725.

FIGURE 16–2

40-day moving average of closing price, Canadian dollar futures. Chart created using TradeStation 4.0 by Omega Research, Inc.



plicated, so has the balance of payments concept. Now various balance of payments concepts based on the net inflows and outflows of U.S. dollars according to various types of transactions are discussed. Among them are:

Merchandise (goods)
Services
Direct investments
Security purchases
Bank claims and liabilities
Government assets abroad

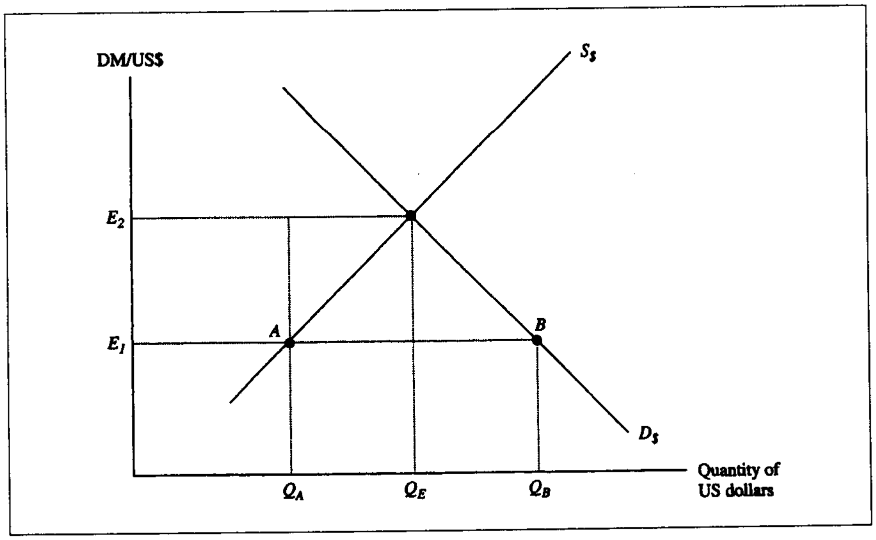
If more dollars flow out of the United States than foreign currency into the United States, then the balance of payments, according to one or a combination of these types of transactions, is said to be in deficit; if more dollars flow in than out, the balance of payments is said to be in surplus.

In general, a balance of payments surplus usually causes the dollar to become stronger relative to foreign currencies (the dollar value of foreign currencies declines) because there are fewer dollars in foreign countries. A balance of payments deficit usually causes the dollar to become weaker relative to foreign currencies (the dollar value of foreign currencies increases) because there are more dollars in foreign countries. The emphasis in the last two sentences should be on the word "usually" because these economic principles, like most others, are often violated. To judge whether the dollar will become stronger or weaker, however, the balance of trade, which includes the balance for merchandise (goods) and services, is most often used.

Figure 16-3 shows how the equilibrium balance of trade model is determined in the *balance of payments* (BOP) model. On the vertical axis, the DM/$US is plotted; the horizontal axis plots the quantity of dollars that flow on the foreign exchange market per interval of time. The flow demand for dollars (D$) is assumed to be generated by German demand for U.S. goods. That derived demand for dollars exists because German residents must first acquire dollars in the foreign exchange market before they make payment for the U.S. goods they wish to purchase. In the same vein, the

FIGURE 16–3

Balance of Payments Flow Model of Exchange Rate Determination.



Source: Michael Rosenberg, *Currency Forecasting* (Chicago: Irwin Professional Publishing, 1996). Used by permission.

flow supply of dollars (S$) is assumed to be generated by U.S. demand for German goods, since U.S. residents must first exchange dollars for deutschemarks in the FX market before they make payment for the German goods they wish to purchase. Thus, in its most basic formulation, the BOP flow model posits that the existence of trade imbalances gives rise to excess supplies of or demands for foreign exchange, which, in turn, results in exchange rate changes. The exchange rate will adjust until the original trade imbalance is corrected and trade balance equilibrium is restored.[5]

Monetary Policy

In the long run, changes in monetary policy have had a profound impact on currency valuation. When the economy is expanding too rapidly, or inflation is a concern, the Federal Reserve Board can limit the amount of money available to the banking system by raising the discount rate, which is the interest rate banks pay to borrow additional reserves. This reduction in the supply of dollars causes the dollar to rise in value relative to other currencies. If, however, the economy is growing too slowly in a relatively benign inflationary environment, the Fed can lower the discount rate, thereby increasing the money supply and causing the dollar to decline in value.

One would expect, assuming an efficient market, that central bank policy changes would be instantly reflected in the currency markets. Surprisingly, the opposite is true; the lags associated with major Fed policy changes are considerably long. Eichenbaum and Evans found that it takes 2 or 3 *years* before a change in U.S. monetary policy is fully reflected in the value of the dollar.[6] One reason that the lag is so pronounced may be that the credibility of the central bank on initial policy changes (i.e., a tightening after long periods of decreasing rates) may be questioned. Exhibit 16-3 shows why this may occur.

Fiscal Policy

Fiscal policy refers to the government's taxation and spending policies and how those policies affect the equilibrium rate of interest (where money demand equals money supply). A policy of increased government spending, which is financed by increasing the federal budget deficit, has two

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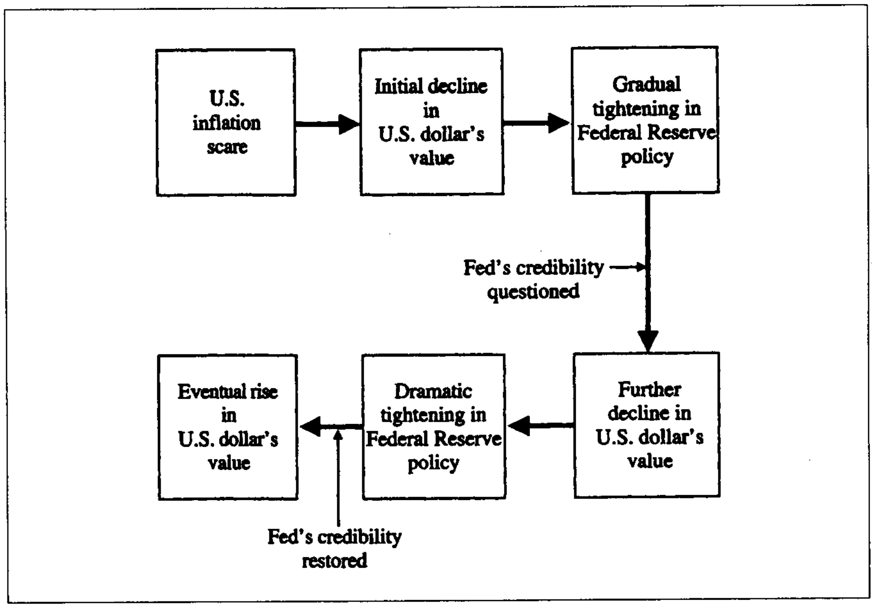
[5] Rosenberg, p. 71.

[6] Martin Eichenbaum and Charles Evans, "Some Empirical Evidence on the Effects of Monetary Policy Shocks on Exchange Rates." NBER Working Paper no. 4271, 1993.

EXHIBIT 16–3

Why the Dollar's Value Responds Gradually to Changes in U.S. Monetary Policy



Source: Michael Rosenburg, *Currency Forecasting* (Chicago: Irwin Professional Publishing, 1996).

effects on a local currency. First, the increased spending would lead to higher interest rates, which would cause the currency to rise in value. However, a substantial increase in government debt could also lead to an increased risk premium on the currency, causing a decline in the value of the currency.

The dominating factor is country-dependent. In the case of the United States, the increased spending in the 1980s caused a marked increase in the value of the dollar. In fact, there has been a close positive correlation between the U.S. federal budget deficit/GDP ratio and the dollar—that is, higher debt levels have been met with higher dollar valuations. However, in countries where debt levels are unusually high compared to their GDP output (Canada and Italy are good examples), the opposite relationship holds. In other words, for these countries the increased risk premium due to higher debt levels causes the local currency to decline in value, more than overwhelming the positive effect of higher interest rates. And in other countries, there appears to be no relationship between fiscal policy and currency valuation.

Central Bank Intervention

Since the beginning of floating exchange rates in 1973, most of the world's central banks have intervened in the foreign exchange markets to forcibly influence the value of their respective currencies. In fact, of the 155 International Monetary Federation nations, only 26 allow their currency to float independently.[7]

Policymakers have a variety of mechanisms at their disposal to influence the path of exchange rate valuation, including monetary policy (raising and lowering interest rates) and fiscal policy (altering the rate of government spending). However, the most often used tool is direct intervention in the foreign exchange market—that is, the buying and selling of one's currency in the open market in the attempt to move the equilibrium price from point A to point B.

Although there are several reasons that a central bank would have an interest in managing its currencies' valuation, the most important reason involves the trade balance between nations. If, for example, the value of the dollar relative to the Japanese yen was unusually high, Japanese goods would be less expensive to U.S. consumers, since a dollar could buy a relatively large amount of yen (at the same time, U.S. goods would be increasingly more expensive to Japanese producers, since more yen would be needed to purchase the same amount of U.S. currency). This would cause the United States to import more goods from Japan, which would negatively impact the purchase of domestically produced goods.

If the U.S. administration decided that the dollar's value relative to the yen needed adjustment, the Federal Reserve could simply sell "dollar-yen" (buy yen with U.S. currency), with the hope that such intervention would lead to a downtrend in the dollar's value. For these reasons, the U.S. and Japanese central banks jointly bought yen with dollars to reverse the dollar's strong uptrend on January 22, 1992. As Figure 16-6 shows, the initial market response was positive; the dollar did indeed

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[7] International Monetary Fund, *Annual Report on Exchange Arrangements and Exchange Restrictions*, 1992.

lose value relative to the yen. But several weeks later, the dollar was at a six-month high against the currency. In this instance, central bank intervention failed.

The question of the efficacy of central bank intervention on exchange rates is indeed an important one. Although there have been some instances of successful intervention,[8] the bulk of research has shown that the impact is minimal and, in most cases, negligible.[9] The only certainty regarding central bank intervention is the significant volatility it introduces to the marketplace.

HEDGE USES

Companies engaged in international commerce, where raw materials are purchased and finished goods are paid for in foreign currency, take considerable exchange rate risk. A 10 percent rise in one currency, for example, can significantly reduce or eliminate profit margins for a given reporting period. Faced with this dilemma, many companies choose to hedge their foreign currency exposure in the currency markets.

For example, suppose a company received a 10 million British pound order for computers in London. The order will be paid for in 3 months. The current exchange rate is 1.80 dollars to 1.00 pound, thus the value of the order in dollars is worth

$$10{,}000{,}000 \times 1.80 \text{ (dollars/pounds)} = \$18{,}000{,}000$$

Suppose the dollar rises to an exchange rate of 1.60 pounds per dollar in 3 months. The value of the contract decreases to $16,000,000—a $2 million dollar loss from the signing of the contract to the payment. Obviously, it is in the computer manufacturer's best interest for the pound to rise relative to the dollar. Using the interbank forward market or exchange-traded contracts, the computer maker can sell a sufficient quantity of pounds to hedge against exchange rate fluctuations between now and the

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8. Pietro Catte, Giampolo Galli, and Salvadore Revecchini, "Concerted Interventions and the Dollar: An Analysis of Daily Data," in *The International Monetary System,* ed Peter B. Kener, Francesco Padia, and Farbrizio Saccomani (Cambridge: Cambridge University Press, 1994).
9. The bulk of research has shown that central bank intervention has no lasting effect. Of particular note, see Warren E. Weber, "Do Sterilized Interventions Affect Exchange Rates?" *Federal Reserve Bank of Minneapolis Quarterly Review* **10** (summer 1986), 14–22.

payment in 3 months or take chances that rates will be stable (or go in the company's favor) and stand pat.

In either case, the manufacturer is speculating on the direction of exchange rates. Hedging receivables in the futures or interbank market is a bet that the dollar will rise against the pound; standing pat represents the view that pounds will rise (or be stable) relative to the dollar. Considering the vast amounts of international trade, the determination of exchange rates is a crucial variable for all corporations.

SPECULATIVE USES

As indicated, prior to the advent of the foreign currency futures markets, large institutions used the bank forward markets for their forward forex transactions. In particular, they often speculated in the foreign exchange markets via these markets. The foreign currency futures markets added little to their possibilities.

Retail investors, however, had no access to forward foreign exchange markets. Thus, with the advent of the foreign currency futures markets, retail investors could use these markets to speculate in the forex markets, and they have in significant amounts. The liquidity and relatively low transaction costs have made the forex futures markets attractive markets to use for speculation.

In fact, these futures contracts have become very large. For example, the deutsche mark and Swiss franc futures contracts, measured in terms of trading volume, have been the eighth and eleventh largest futures contracts recently. The trading volume of the five active currencies in the aggregate would make them rank as the third largest futures contract. Speculators account for much of this trading volume.

The speculative uses of the forex futures markets are, in concept, relatively simple. Speculators buy forex futures contracts when they believe that the foreign currency will become stronger relative to the dollar (that is, the dollar will become weaker). And they sell forex futures contracts when they believe that the foreign currency will become weaker relative to the dollar (that is, the dollar will become stronger). Speculators have shown a particular interest in "shorting the dollar," that is, buying forex futures contracts.

Retail speculators can also speculate on the basis of moves of one foreign currency against another foreign currency, with the strength of the dollar not involved, by buying a futures contract in the currency they think will be strong and selling a futures contract in the currency they think will be weak—that is, conducting an intercontract spread. For example, to speculate on the basis of the British pound strengthening against the Japanese yen, one would buy the British pound futures and sell the Japanese yen futures. There would, thus, be a profit on this spread if the pound strengthened against the yen, independent of what happened to either vis-à-vis the dollar.

Foreign currency speculators use both technical methods and the fundamental factors for foreign currency speculation. As discussed in Chapter 9, there are also options on foreign currency futures contracts.

The forex markets trade and are monitored worldwide on a 24-hour-a-day basis, and they are among the most widely followed markets, in addition to being among the most exciting markets in which to speculate. They have also exhibited considerable price variability, as shown in Figures 16-4 through 16-8 for the five major foreign currency futures contracts.

FIGURE 16-4

Swiss franc futures contract, 1978–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.

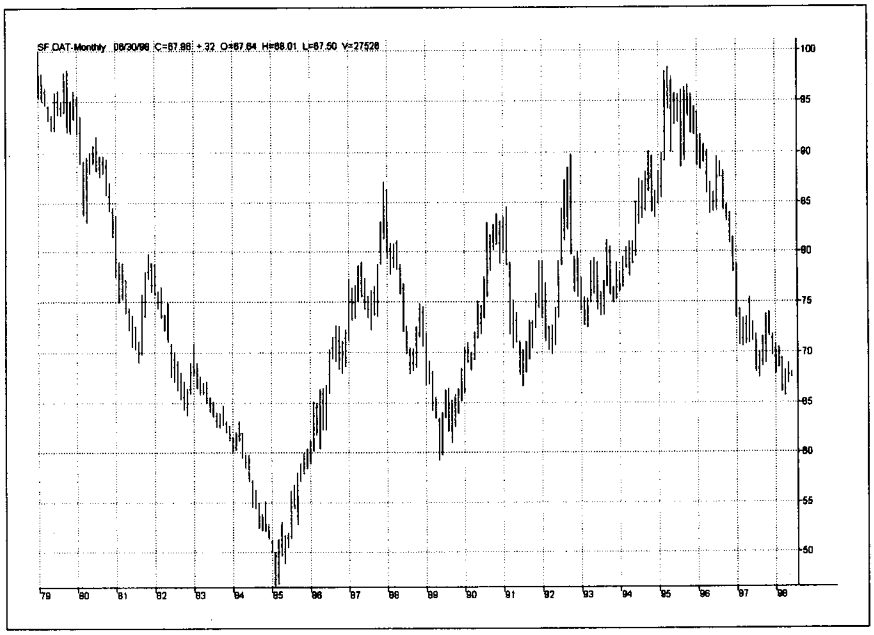


FIGURE 16–5

British pound futures contract, 1978–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.

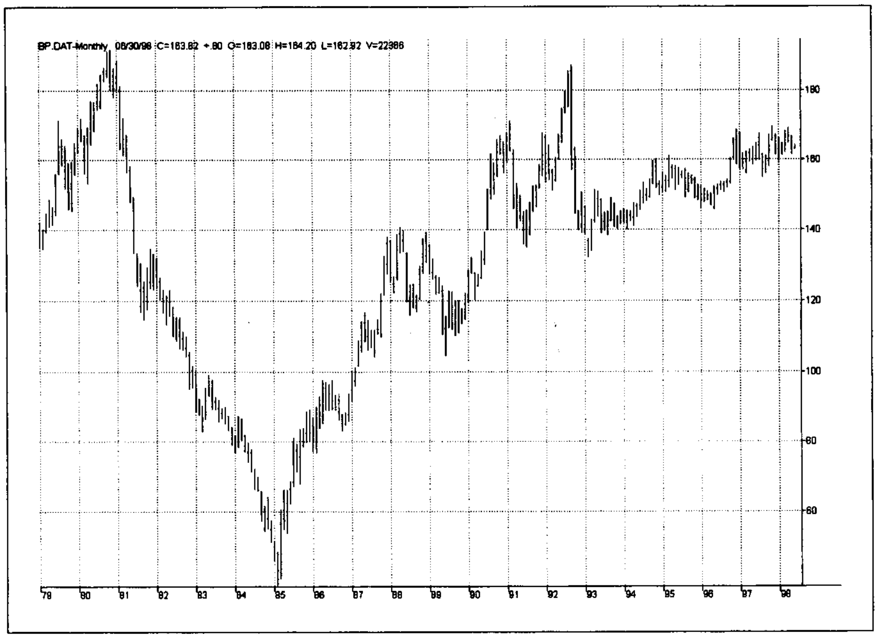


FIGURE 16–6

Japanese yen futures contract, 1978–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.

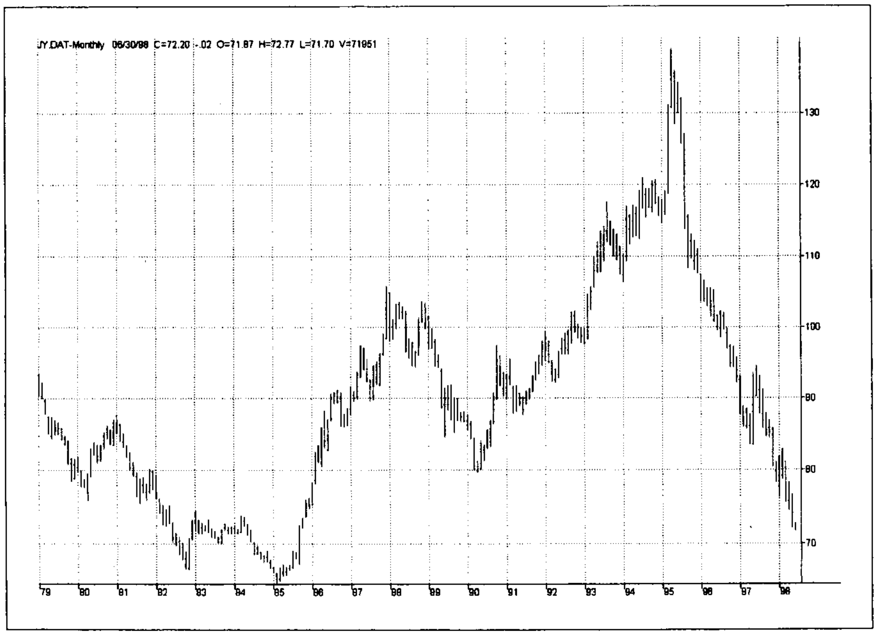


FIGURE 16–7

German d-mark futures contract, 1978–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.

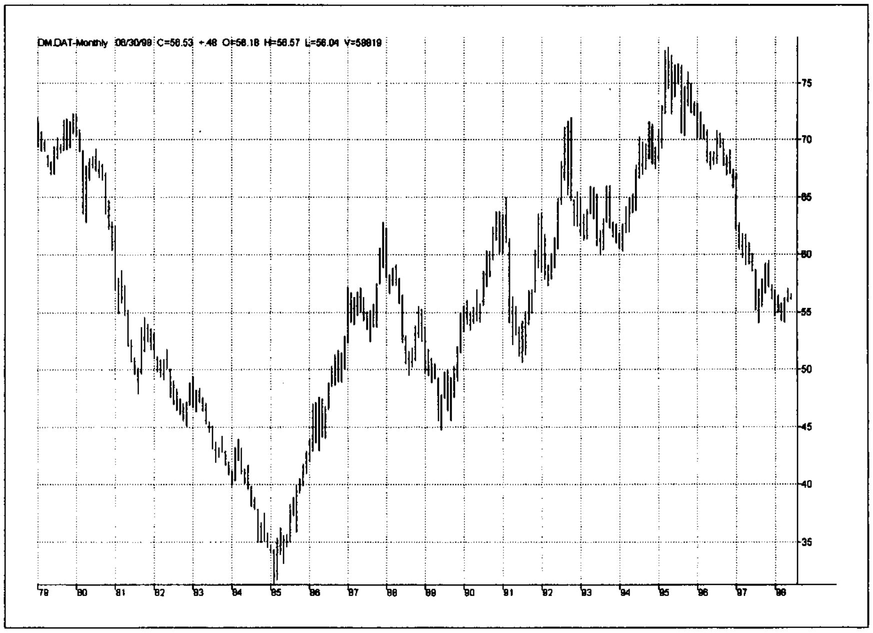
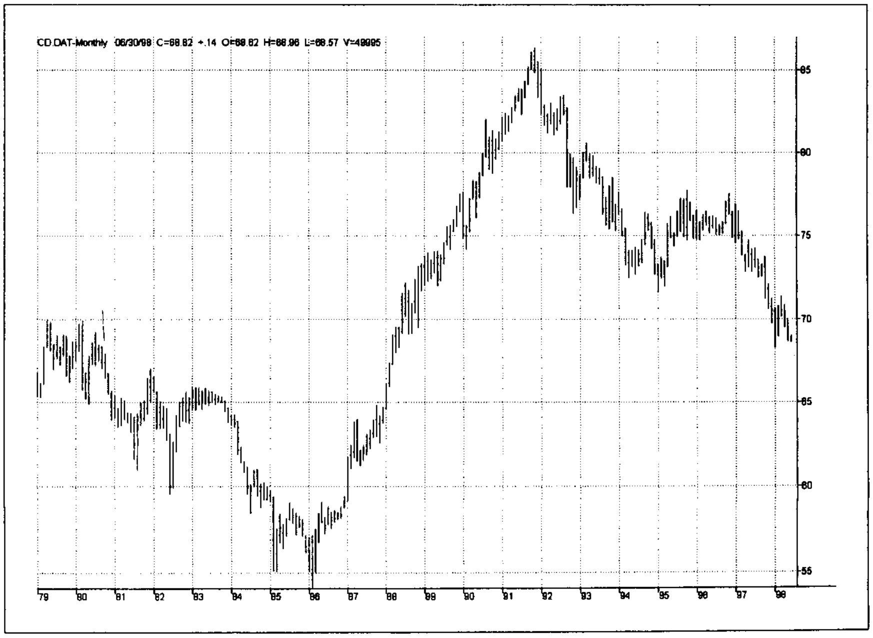


FIGURE 16–8

Canadian dollar futures contract, 1978–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



NOTES FROM A TRADER— FOREIGN CURRENCY FUTURES

The rapid growth of the foreign currency futures markets is a reflection of the broad appeal of "trading the dollar" against foreign currencies and the foreign currency futures markets as good trading vehicles.

Currency trading is primarily fundamental, although technical methods are also used. Fundamentalists watch U.S. and foreign interest rates and the factors that affect these interest rates. Balance of trade announcements are also closely watched. Government foreign exchange rate policies and even rumors of changes in these policies may have significant, sudden effects on forex futures prices. Traders also trade foreign currencies against each other by using two futures contracts.

Currency futures prices evidence both long trends and considerable daily volatility. The currency futures markets are very liquid, although they tend to be thinner in the afternoon, particularly on Friday, when the London markets are closed.

17 CHAPTER

Grains and Oilseeds

"Plant in the dust and your pockets will bust."

—*Wheat farmer adage*

INTRODUCTION

This chapter discusses futures based on the U.S. and Canadian grain and oilseed markets. These contracts include the soybean complex, corn, wheat, oats, canola, flaxseed, and barley. Grains were one of the first commodities traded at U.S. exchanges and, before the advent of financial futures, were the most widely traded futures contracts on the Chicago Board of Trade.

THE SOYBEAN COMPLEX

The soybean (Glycine max) is the world's leading source of protein and edible oil. The soybean is a legume related to clover, peas, and alfalfa. Originally used as an inexpensive ballast for ships sailing from the Orient, soybeans were first grown in the United States in the early 1800s as a forage for livestock. George Washington Carver's discovery of the uses of soy meal and oil roughly 100 years later resulted in greatly increased domestic production. By 1929, the U.S. soybean harvest had grown to 9 million bushels.[1] The soybean became a staple of the U.S. diet during World War II, when the available supply of animal-based shortening (40 percent of which was imported) was greatly diminished. Desperate for a substitute, U.S. food processors turned to soybeans. Soy oil remains the world's leading consumable oilseed. Soy meal also gained favor as a low-cost, high-protein feed ingredient.

Exhibit 17-1 shows the composition of the soybean.

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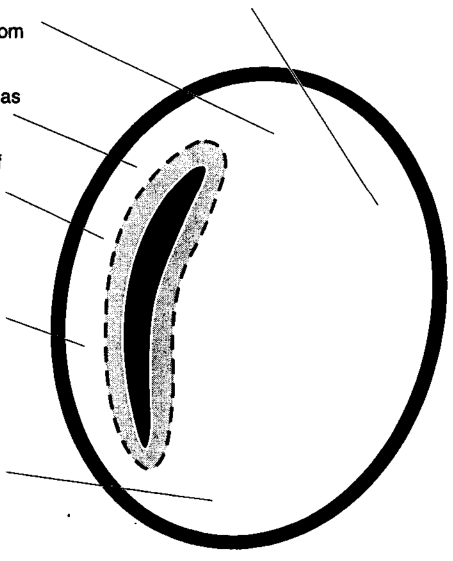
[1] American Soybean Association.

EXHIBIT 17-1

Composition of the Soybean



The dry (solid) portion of the bean provides a host of edible products. Soy flours and grits are used in the commercial baking industry. They aid in dough-conditioning and bleaching. Their excellent moisture-holding qualities also help retard staling.

Lecithin, extracted from soybean oil, is used for everything from pharmaceuticals to protective coatings. It is a natural emulsifier and lubricant. Lecithin is used, for example, to keep the chocolate and cocoa butter in a candy bar from separating.

Soybean oil finds its way into such products as margarine, salad and cooking oils.

The soybean is the highest natural source of dietary fiber. Soy hulls are processed into fiber bran breads, cereal and snacks.

In processing, the soybeans are cleaned, cracked, dehulled and rolled into flakes. This ruptures the oil cells for efficient extraction. After removal of the soybean oil, the remaining flakes can be processed into various edible soy protein products or used to produce protein meal for animal feeds.

The eight essential amino acids are found in soybeans which are necessary for human nutrition and are not produced naturally in the body.

Source: American Soybean Association.

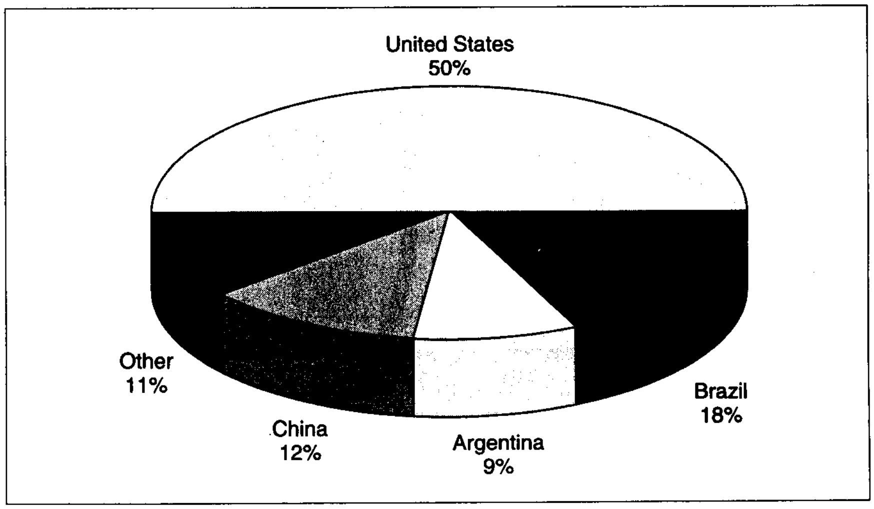
Soybeans

The United States is the world's largest producer of soybeans, as shown in Table 17-1, accounting for over 50 percent of the world's total. Farmers in over 29 states grow soybeans, making it the second largest crop in the United States. About half of the total domestic soybean harvest is sold abroad.

Soybean processing involves separating the oil and the protein from the soybeans—soybeans contain approximately 20 percent oil and 40 percent protein. Various methods are used for processing. Previously in the United States, mechanical methods were used, involving mainly various types of presses, and these methods are still used in many parts of the world. Currently in the United States a solvent extraction method is predominantly used. In the solvent extraction method, which leaves a much smaller amount (approximately 1 percent) of the oil in residue, soybeans are first hulled, cracked, and flaked and then put in a solvent (typically hexane) which dissolves the oil from the soybeans. From this solution, the solvent is evaporated, and what is left is crude soybean oil. The crude soybean oil is degummed and refined before use. The residue soybean cake is cooked and then ground into soybean meal. A bushel of soybeans (60 pounds) will produce about 10.7 pounds of soybean oil and

TABLE 17–1

World Soybean Production 1994



Source: American Soybean Association

47.5 pounds of soybean meal. However, because of differences in prices, meal accounts for only 55 to 60 percent of the combined value of meal and oil.

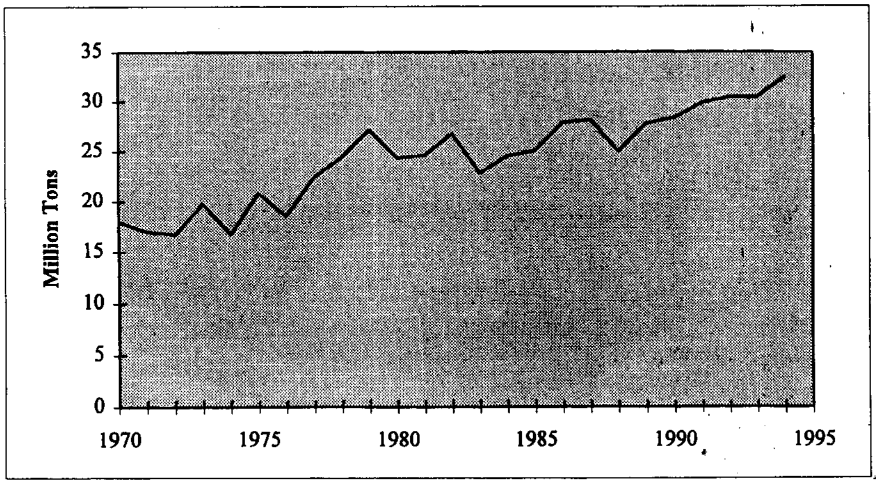
Soybean Meal

Soybean meal is the principal high-protein meal in the world, accounting for approximately two-thirds of the total, with cottonseed, fish, peanuts, sunflower seed, rapeseed, and flaxseed accounting for the remainder. Soybean meal is used mainly in the animal feed industry, primarily as a protein supplement in poultry and livestock feed.

As with soybeans, the United States is the world's major soybean meal producer, accounting for approximately 50 percent of total production. Brazil and the European Economic Community each account for 15 to 20 percent of world production. The United States and Brazil are the major exporters of soybean meal. The European Economic Community is the world's major importer of soybean meal, with Japan also a major importer. Approximately 75 percent of the United States soybean meal production is used domestically for animal feed, and the rest is exported. Table 17-2 provides data on the U.S. supply, distribution, and export of soybean meal.

TABLE 17–2A

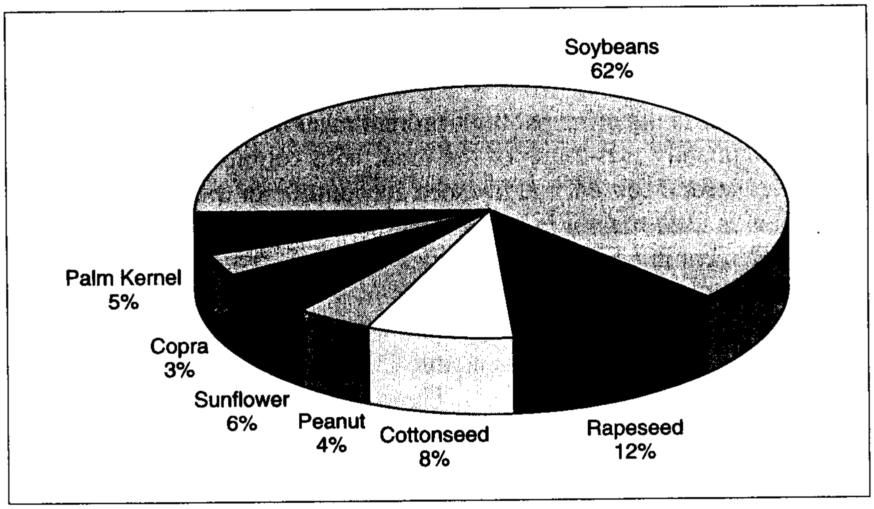
U.S. Soybean Meal Production 1970–1994



Source: American Soybean Association

TABLE 17-2B

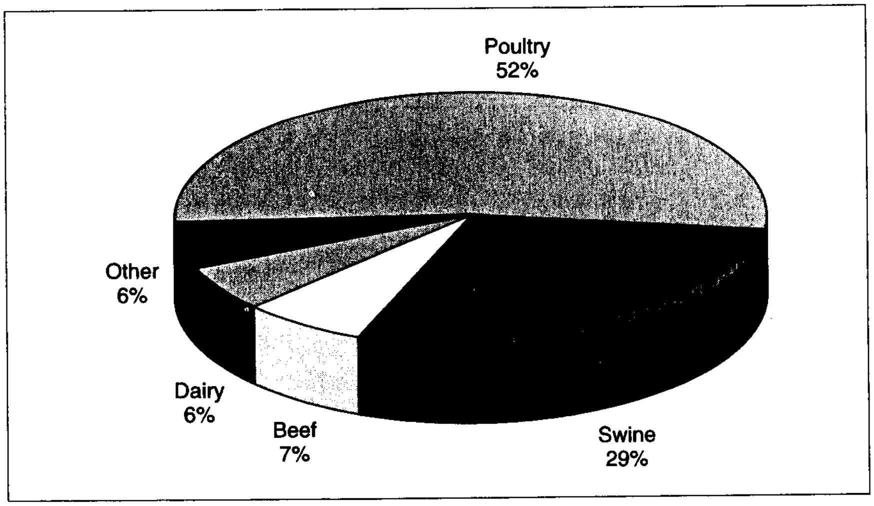
World Protein Meal Consumption in 1994



Source: American Soybean Association

TABLE 17-2C

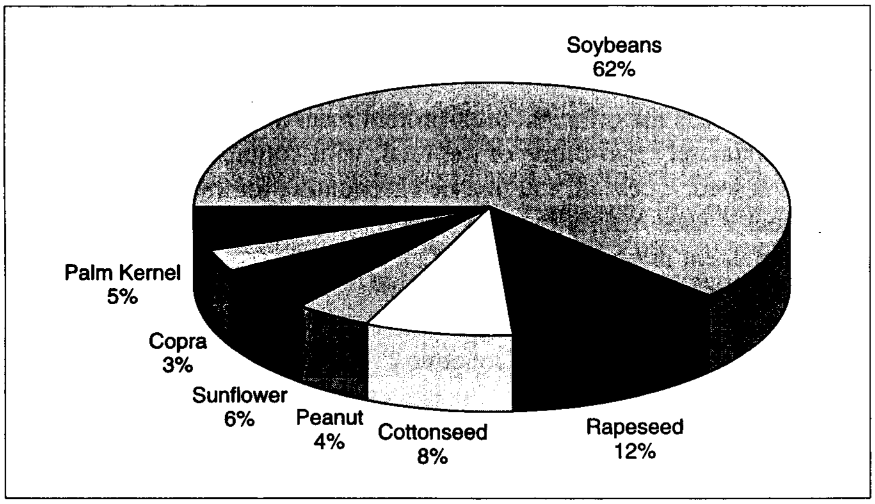
Soybean Meal Use by Livestock, 1994



Source: American Soybean Association

TABLE 17–2B

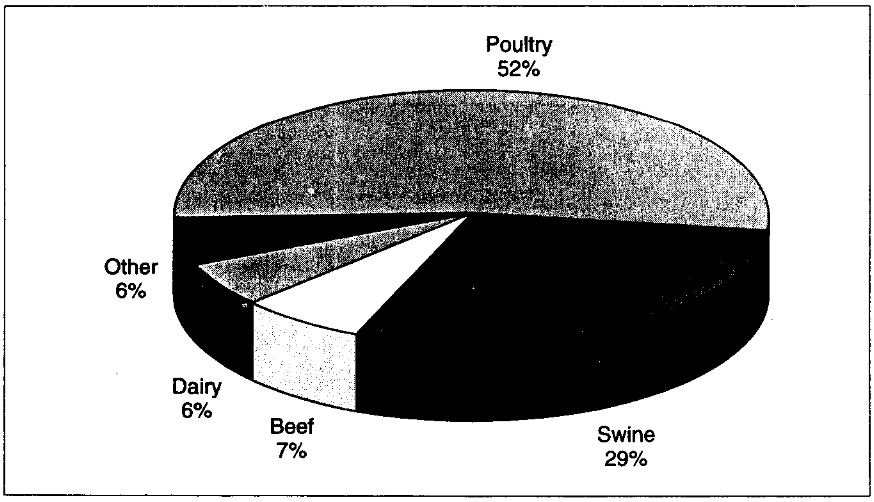
World Protein Meal Consumption in 1994



Source: American Soybean Association

TABLE 17–2C

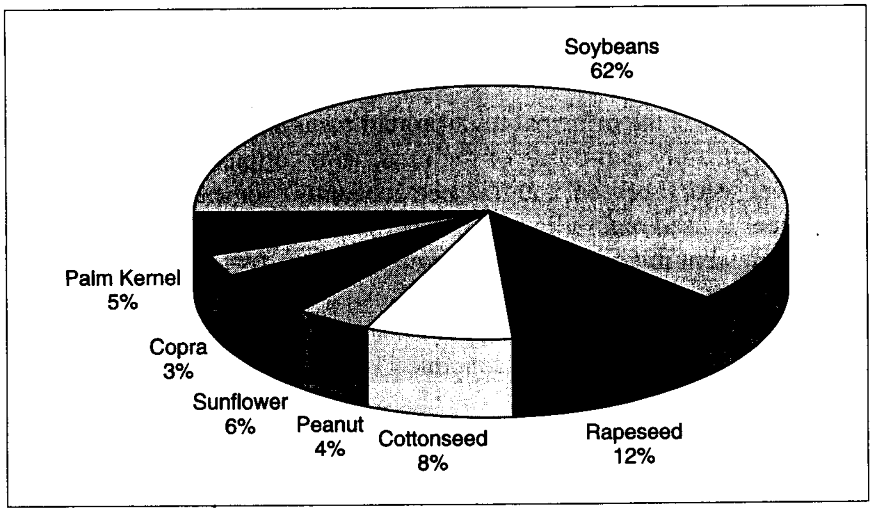
Soybean Meal Use by Livestock, 1994



Source: American Soybean Association

TABLE 17–2B

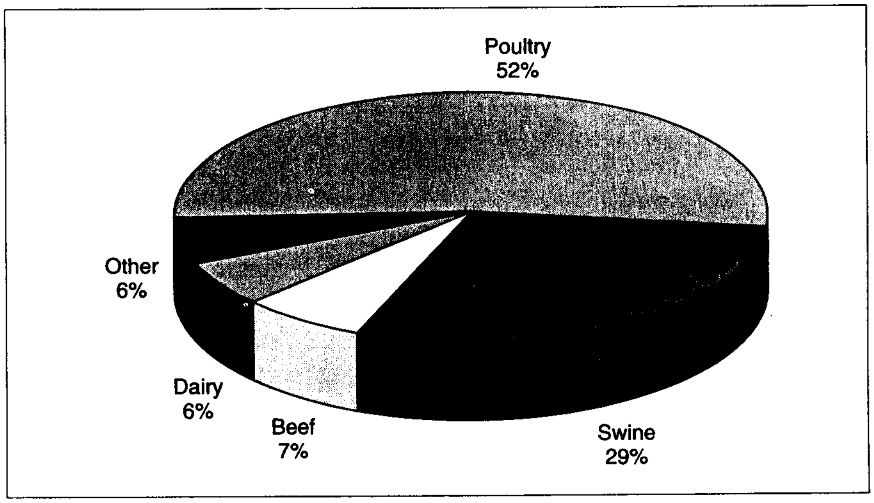
World Protein Meal Consumption in 1994



Source: American Soybean Association

TABLE 17–2C

Soybean Meal Use by Livestock, 1994



Source: American Soybean Association

Soybean Oil

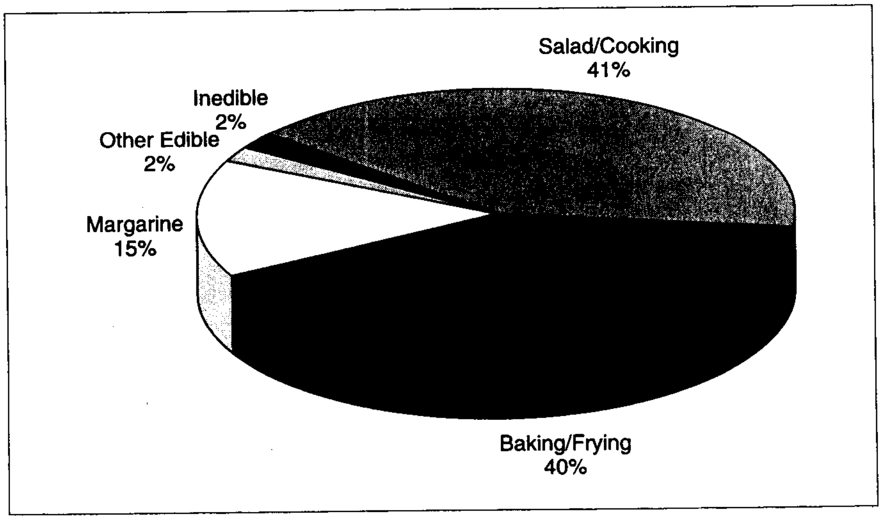
Soybean oil is the world's major edible oil, accounting for about one-third of the world's total. Soybean oil is used mainly in salad and cooking oil, shortening, and margarine, as shown in Table 17-3, for U.S. use. Other world edible oils, in order of importance, are sunflower, palm, cottonseed, coconut, peanut, rapeseed, and olive. The United States is the world's largest producer of soybean oil, accounting for approximately 40 percent of the world's total. Brazil and Argentina are also major producers, accounting for 20 percent and 16 percent, respectively, of the world's total.

In the United States, about 20 percent of the soybean oil produced is exported—Table 17-4 provides data on production and consumption of U.S. soybean oil. The United States and Brazil are also among the world's largest exporters. The European Economic Community, along with several developing countries, including India, Pakistan, and North Africa, is the major market for soybean oil.

Table 17-5 summarizes the major uses for soybeans, soybean meal, and soybean oil.

TABLE 17-3

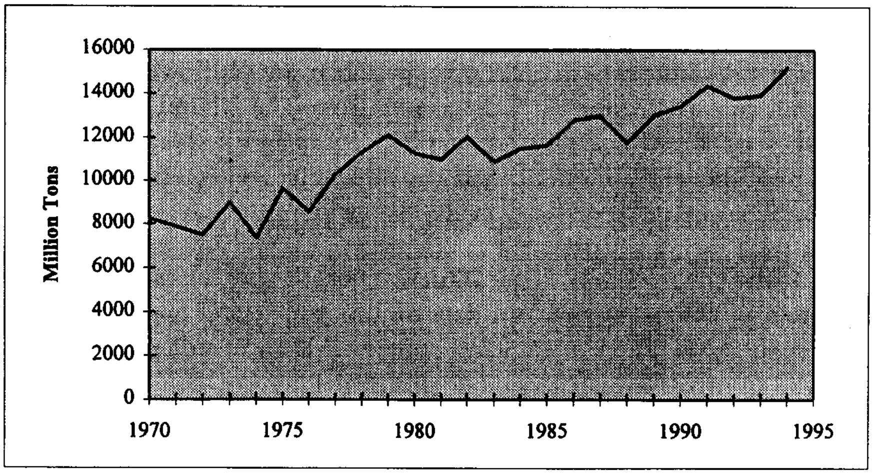
U.S. Soybean Oil Consumption, 1994



Source: American Soybean Association

TABLE 17–4A

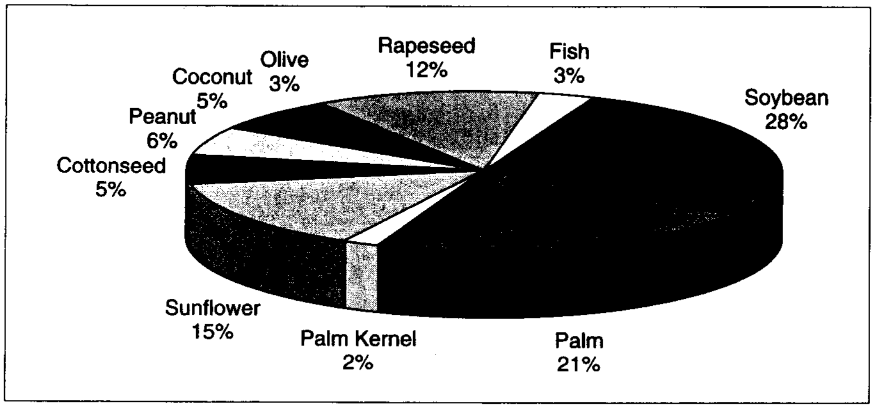
U.S. Soybean Oil Production, 1970–1994



Source: American Soybean Association

TABLE 17–4B

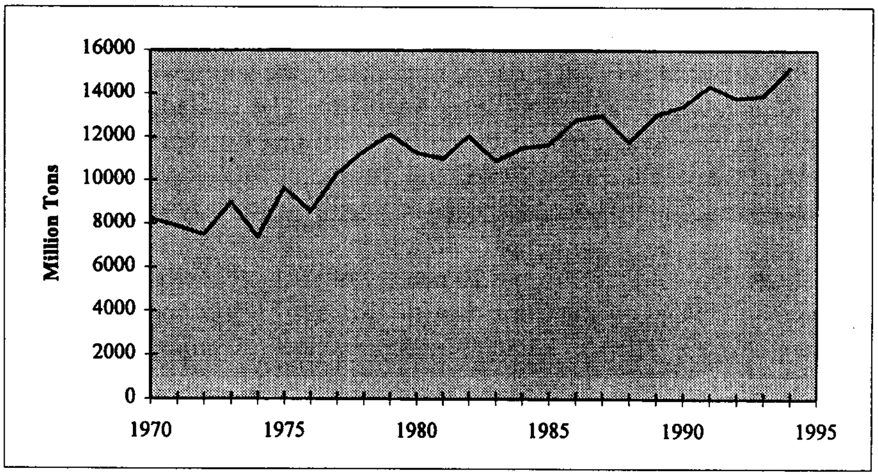
World Vegetable and Marine Oil Consumption, 1994



Source: American Soybean Association

TABLE 17–4A

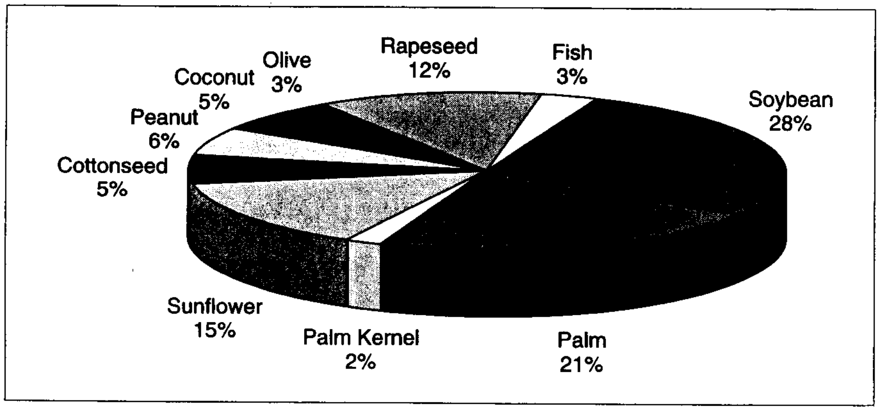
U.S. Soybean Oil Production, 1970–1994



Source: American Soybean Association

TABLE 17–4B

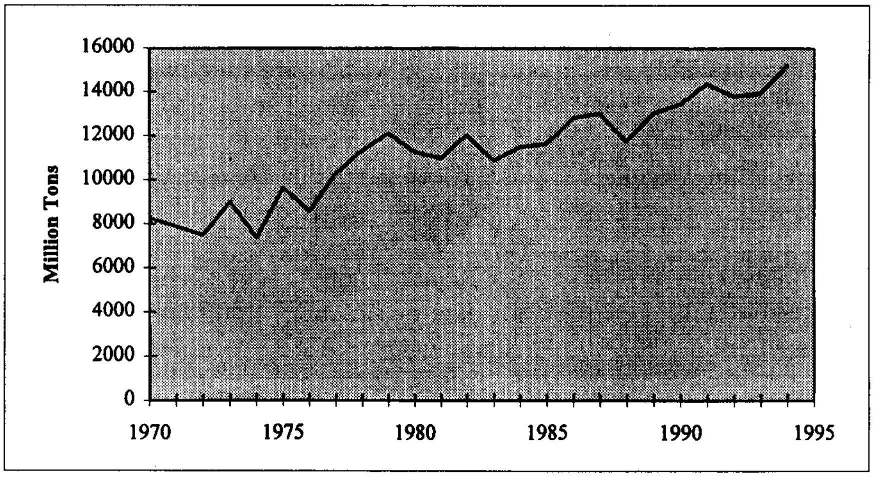
World Vegetable and Marine Oil Consumption, 1994



Source: American Soybean Association

TABLE 17–4A

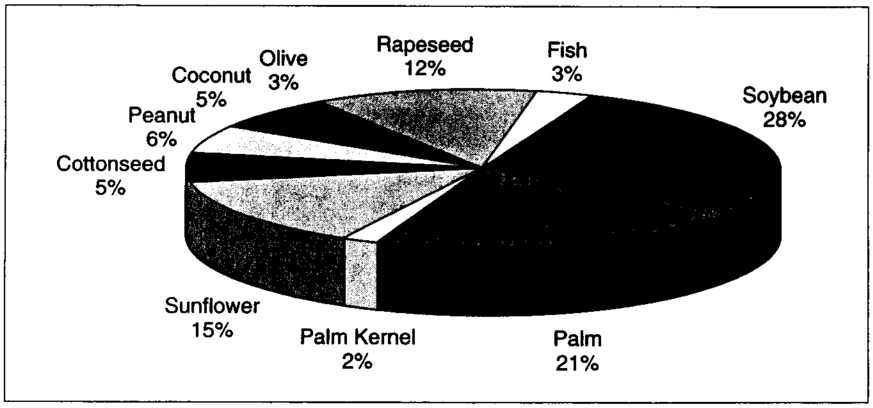
U.S. Soybean Oil Production, 1970–1994



Source: American Soybean Association

TABLE 17–4B

World Vegetable and Marine Oil Consumption, 1994



Source: American Soybean Association

TABLE 17–5

Uses of Soybeans, Soybean Oil, and Soybean Meal

	Foods	Feed	Industrial	Seed
Whole soybeans	Baked soybeans	Puffed soybeans		Hybridization planting
	Dietetic foods	Roasted soybeans		
	Full-fat soy flour	Steamed soybeans		
	Roasted soybeans			
	Soy butter			
	Soy cereal			
Soybean oil	(Refined soybean oil)		(Refined soybean oil)	
	Cooking oil		Adhesives	
	Margarine		Disinfectants	
	Mayonnaise		Inks	
	Prepared foods		Plastics	
	Salad oil			
	Spreads			
	(Soybean lecithin)		(Soybean lecithin)	
	Coatings		Antifoam agents	
	Emulsifiers		Antiknock additives	
	Nutrients		Dispensing agents	
			(Sterols)	
			(Fatty acids)	
			(Glycerols)	
Soybean meal	(Basic meal)	(Basic meal)	(Basic meal)	
	Baby foods	Millfeeds	Fertilizers	
	Bakery items	Livestock feeds	Fillers	
	Beverages	Pet foods		
	Cereals	Poultry feeds	(Soy flour, grits)	
	Confections		Adhesives	
	Dietetic foods	(Soybean millfeeds)	Coatings	
	Meat analogues			
	Meat products			
	Soups			
	(Isolated proteins)			
	(Soy flour, grits)			

Source: *Commodity Trading Manual* (Chicago Board of Trade, 1982).

Price Determinants

Soybeans have no major use in their own form; they are used only for processing into their products. In addition, there are no trade-offs in the production of meal and oil; that is, no more of one can be produced if less of the other is produced. Thus, soybean products are truly joint products, and the prices of soybeans, meal, and oil are integrally interrelated. However, because there are differences in the demands for oil and meal, the prices of these two can move somewhat semi-independently.

Soybean meal prices are determined mainly by:

- The number and types of animals in the United States and other countries which consume high-protein feed
- Livestock and poultry prices
- The price and availability of other high-protein feed supplements mentioned above
- The level of soybean and soybean meal stocks
- The overall level of domestic and export demand

Soybean oil prices are determined mainly by:

- The price and availability of soybean oil substitutes such as lard, cottonseed oil, and butter
- The level of imports of palm oil and coconut oil
- The availability of foreign-produced oils, including palm oil and coconut oil, sunflower oil, rapeseed oil, and peanut oil, which affects the demand for and the level of U.S. exports

The price of soybeans is obviously affected by the demands for soybean meal and oil, which are, in turn, affected by the factors mentioned above. In the opposite direction, the prices of soybean meal and oil are affected by soybean prices. Soybean prices are also affected by the worldwide supply of soybeans, which may be affected by weather, strikes, and the levels of stocks on farms, in terminals, or in processing plants.

Government policies in the United States, Brazil, the European Economic Community, and other countries also play an important role in determining supply, exports, imports, and, thus, prices. Brazilian policies have fostered the domestic production and processing of soybeans. In the United States, in many years soybean price support levels have been set (by a formula based on the average soybean prices of previous years), giving soybean producers the option of borrowing money from the Commodity Credit Corporation (CCC) and using the stored soybeans as collateral, as discussed below.

Finally, the level of international exchange rates affects the prices of soybeans, meal, and oil expressed in dollars and, thus, affects the level of exports. For example, during early 1985 the prices of soybeans and soybean products in terms of foreign currencies were high, and the level of U.S. exports was low due to the strength of the dollar. Soybean prices and the prices of other U.S. agricultural goods which are heavily exported were, as a result, quite low.

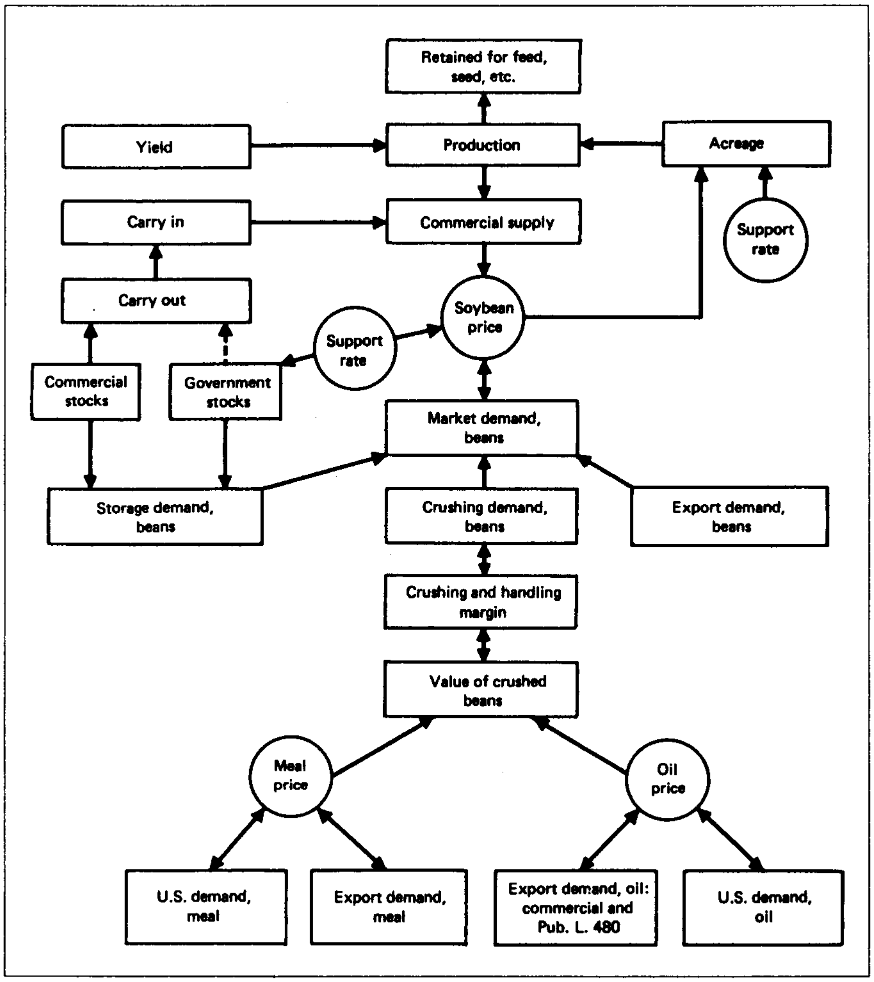
Because soybean meal and oil are joint products, their prices are interrelated. But because of their different demands, their prices can move differently. For example, if there were a strong demand for meal for feed, there would be an increase in soybean and soybean meal prices. This soybean meal demand and production, however, could lead to a buildup of oil stocks and a decrease in oil prices. In general, the level of soybean processing activity is determined more by the demand for meal than by the demand for oil because meal is bulky and, thus, expensive to store, and it also does not store well for long periods. Soybean oil, on the other hand, is storable; thus, inventories of oil can moderate temporary supply-demand imbalances. Figure 17-1 presents an overview of the structure for pricing soybeans and soybean products.

In recent years the demand for soybean meal has been growing more quickly than the demand for soybean oil. In addition, the value of meal is greater than that of oil in bean processing. For these reasons, even though soybean meal and oil are joint products of soybeans, the price of meal has generally determined the amount of soybeans crushed and, therefore, the domestic supply of oil as well as the supply of meal. Also for these reasons, oil is often considered a by-product of meal rather than a joint product in soybean processing.

Figures 17-2, 17-3, and 17-4 show the considerable variability of soybean, soybean meal, and soybean oil futures prices. Prior to 1972, soybean prices had been fairly stable at approximately $3 per bushel. During 1972 and 1973, however, soybean prices exceeded $12 due to a series of occurrences, including the purchase of a large quantity of soybeans by Russia during 1972 due to that country's shortage of sunflower seeds and large livestock production; rain in the United States, which reduced the 1972 crop; a reduced supply of Peruvian fish meal due to the unexplained migration of Peruvian anchovies; a drought in India, which reduced India's supply of peanuts; and other factors.

FIGURE 17-1

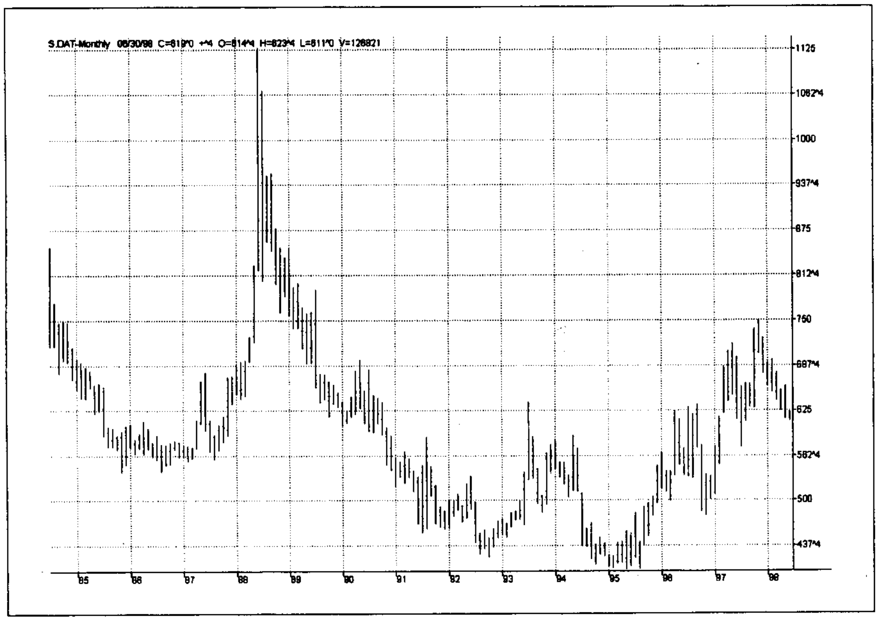
Factors influencing prices in the soybean complex. (Houck et al., *Soybeans and Their Products—Markets, Models and Policy.)*



Soybean farmers have several ways of marketing or selling their soybeans. The standard way is to harvest the soybeans, deliver them to the local elevator, and then sell them at the prevailing price. There are two alternative ways which have similar results. One is to enter into a cash contract whereby the farmers establish the cash price at which they will sell their crops before they harvest them. The other is to sell soybean futures

FIGURE 17–2

Soybean futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.

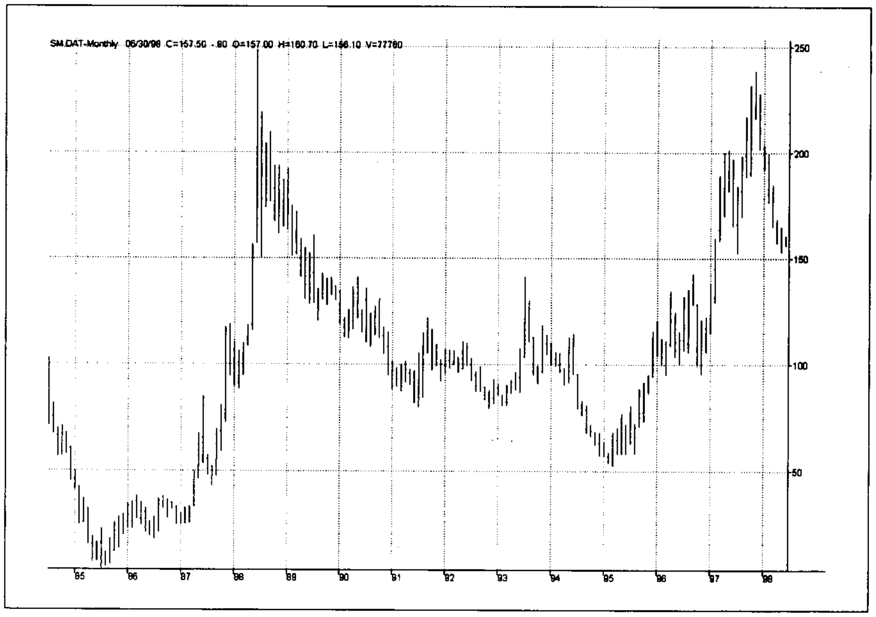


contracts prior to the harvest to establish the sales price. The futures market mechanism provides more flexibility but also more basis risk. The basis risk results from the difference in the grade and location of the farmer's beans relative to those established in the futures contract. Farmers can also delay the pricing of their beans by delivering them to the elevator but delaying the pricing decision—for example, by setting a future price based on a future cash or futures market price.

To soybean processors, soybeans are a purchased input and meal and oil are products sold. Thus, the spread between the price the processors pay for the soybeans and the price at which they sell the meal and oil represents their profit margin, called the "gross processing margin" (GPM). This relationship is the basis for the "crush spread" among soybean, soybean meal, and soybean oil futures contracts, and it is very similar in concept to the crack spread in petroleum futures. Table 17-6 provides an example of a calculation of the GPM. The processor in the example "grosses" 44 cents per bushel. To determine the processor's net profit, other costs must be deducted.

FIGURE 17-3

Soybean meal futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



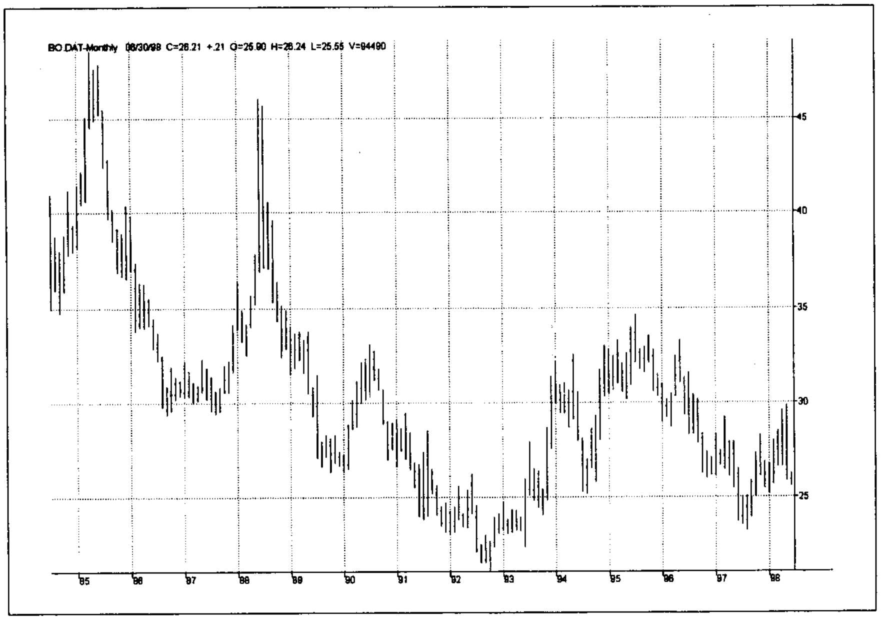
Futures Contracts

The major futures markets for the soybean complex are at the Chicago Board of Trade (CBT), where the soybean futures contract began to be traded during 1936 and soybean oil and soybean meal futures contracts began to be traded during 1950 and 1951, respectively. The MidAmerica Commodity Exchange (MCE) began trading a soybean futures contract during 1940. The London Commodity Exchange trades futures contracts on soybean meal and oil, and several exchanges in Japan trade soybeans.

The soybean futures contract at the CBT has traditionally been the most active agricultural futures contract in terms of trading volume. The soybean futures contract at the CBT is based on the delivery of 5000 bushels of No. 2 yellow soybeans (substitutions are permitted at specified price differentials) by warehouse receipts from approved warehouses in Chicago, Illinois, and Toledo, Ohio. The delivery months are January, March, May, July, September, and November. Futures prices are quoted in cents per bushel, with ¼ cent being the minimum price change. The MCE

FIGURE 17-4

Soybean oil futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



soybean contract is identical in every way except that the size is 1000 bushels.

The sizes of the CBT soybean meal and oil futures contracts are 100 tons and 60,000 pounds (one standard tank car), respectively. Prices are quoted in dollars and cents per ton (with a minimum price change of 10 cents per ton) for the meal contract and in dollars and cents per 100 pounds (with a minimum price change of 1 cent per 100 pounds) for the oil contract. More detailed futures contract specifications are available in Chapter 3.

Hedging Uses

The futures contracts on the soybean complex have been used extensively for commercial hedging. Soybean processors commonly use the futures market to lock in the GPM (see Figure 17-6). Since processors are at risk due to increases in soybean prices and decreases in soybean meal and oil, they can buy soybean futures and sell soybean meal and oil futures to lock in their spread—this is known as the "crush spread" or BOM (bean-oil-

TABLE 17–6

Calculation of Gross Processing Margin

	Price	Yield per Bushel of Soybeans
Soybeans	$5.70 per bushel	—
Soybean meal	$120.20 per ton	47.9 pounds
Soybean oil	$30.75 per hundred pound	10.6 pounds
Value of meal per bushel: ($120.20/2000) × 47.9 =		$2.88 per bushel
Value of oil per bushel: ($30.75 × 10.6)/100 =		$3.26 per bushel
Total value of meal and oil:		$6.14 per bushel
Cost of soybeans:		– $5.70 per bushel
Gross processing margin:		$0.44 per bushel

meal). The crush spread is utilized to protect against a decrease in the GPM. Alternatively, if one thought that the GPM was so low that it would be unprofitable to process beans and that the GPM would increase, one could put on the reverse crush spread by selling soybean futures and buying contracts on soybean meal and oil.

Soybean farmers are also active hedgers and commonly sell soybean futures to protect against price declines during harvest. Cattle and poultry feeders have bought soybean meal futures to protect against price increases; food processors buy soybean oil futures as insurance in case of a shortage in the edible oil market.

Speculative Uses

The success and activity of the soybean complex futures contracts have not been due to commercial hedgers alone. The soybean complex futures contracts, particularly the soybean futures contract, have also been important speculative vehicles. Speculators can and do buy and sell soybean futures contracts on the basis of the determinants of prices listed above. Since soybeans and their products are actively traded internationally, many foreign as well as domestic factors must be considered in speculating with the soybean complex futures contracts. Soybean futures prices are often very sensitive to exchange rates. The weather in the United States (particularly the amount of rain in July and early August) and in other soybean-producing countries, particularly Brazil, has also always been an important basis for speculation.

Speculators also trade the crush spread and the reverse crush spread on the basis of their forecasts of the GPM. A somewhat related activity of speculators is spreading soybean meal versus soybean oil on the basis of their relative prices.

Several types of spreads are important in soybean speculation. The main soybean spread is the old-crop-new-crop spread. The trading months of bean, meal, and oil futures contracts include January, March, May, July, and September. In addition, there are a November contract for trading bean futures and October and December contracts for trading meal and oil futures. Given the harvesting and processing schedules, September 1 represents the beginning of the new crop year for soybeans. Thus, during January, a long July–short September soybean futures spread would be a spread across years based on speculation on a bountiful new crop. Bullish traders often spread a long nearby contract against a short deferred contract within a crop year instead of just establishing outright long positions. Bearish traders often do the opposite. Speculators also spread soybeans against wheat and corn on the basis of their relative fundamentals or on the basis of their different seasonals. The futures contracts on soybeans and soybean products have long been and remain the premier agricultural speculative vehicles.

Sources of Information—The Soybean Complex

The USDA provides several invaluable sources of information. The USDA's quarterly report on grain stocks in all positions for all grains is particularly useful. The October report, however, is a special soybean report which gives the carry-over of soybeans as of September 1. The USDA also provides the *Preliminary Planting Intention Survey* during January, the *Planting Intentions* report during April, and subsequent crop estimates to provide sequential estimates of the production process. The USDA also publishes the weekly (on Thursday) *Export Sales Report,* which covers export shipments of beans, oil, and meal by destination. The USDA *Fats and Oils Situation* report provides data on and forecasts of the supply and demand for soybeans. The USDA's *Weekly Roundup of World Production and Trade* provides information on foreign supply and demand. Finally, the

USDA *Fats and Oils Situation* report provides information on the supply and demand for soybean oil and meal.

The Bureau of the Census publishes monthly reports on the stocks, crushing, exports, and disappearance of soybeans. The National Soybean Processors Association reports on soybean crushing on a weekly basis. The *Oil World,* a trade publication, provides international information on soybeans, oil, and meal. The Chicago Board of Trade, in various publications, also provides information about the cash and futures markets in the soybean complex.

Notes from a Trader

Soybeans are more popular among spreaders than most other markets. In addition to the usual old-crop-new-crop spreads, it is possible to spread oil versus meal or both products versus beans. The September-November spread is appealing to those who expect late crops when the carry-over is small. One should remember that oil and meal prices do not always go in opposite directions and also that one contract of beans does not equal one contract of oil plus one contract of meal—this position emphasizes the oil.

Long oil versus short meal has seldom worked favorably when oil has been in a carrying-charge market. Traders in the reverse crush want carrying charges in beans to indicate large supplies but inversion in at least one of the two products to indicate good demand.

Traders bullish on beans may prefer to go long on nearby contracts versus short on distant contracts rather than establish outright long positions. Bears may wish to sell nearby and buy distant contracts. Traders should be careful about using distant contracts for spreads to reduce margins, for they might find that the open interest is so small that the real risk in the spread is greater than would exist in a net position if adversity developed.

Rain in July and early August is especially critical to new-crop beans; therefore, the market is especially responsive to weather during the late summer. Soybean futures markets have tended to react to government reports more violently than grains, although as the size of the crop in relation to demand continues to expand, this will become less obvious.

As the bean crop year wears on, especially after the December 1 crop estimate, price becomes more and more a function of demand. If there is one "moment of truth" in the bean market, it probably involves the January 1 stocks in all positions.

GRAINS—DOMESTIC

Wheat

Introduction Wheat is the principal U.S. cereal grain for export and domestic consumption. Wheat is the fourth largest U.S. field crop and the leading export crop. It is consumed in virtually every country in the world, is grown in most countries, and is harvested in every month of the year.

Supply As shown in Table 17-7, China is the world's predominant wheat grower, accounting for about 18 percent of world production. Other major producers include India, the United States, and Russia. Egypt, Japan, and China are among the largest importers of wheat.

Wheat is actually a grass whose kernels grow in compact heads on the end of the hollow stalks. Wheat produced in the United States can be divided, for the most part, into common and durum. Common wheat is classified according to two primary qualities: by color (red or white) and by hardness (hard or soft). The time of planting, winter or spring, is another category of classification. About half the wheat produced in the United States is winter wheat; that is, it is planted in the fall, lies dormant during the winter (ideally under a snow cover), and is harvested between late May and July, depending on location. Spring wheat is planted as early during the spring as the ground is workable and grows continuously until its harvest in the late summer. Hard wheats, the major portion of U.S. wheat production, are high in protein and contain large quantities of strong, elastic gluten, both of which make them very desirable for bread in the United States.

The three major types of common wheat produced in the United States, as summarized in Table 17-8, are Hard Red winter wheat, Hard Red spring wheat, and Soft Red winter wheat. Hard Red winter wheat is grown in Kansas, Nebraska, Oklahoma, and Texas. These regions have low rainfall and cold winters. Because their winters are too harsh for producing winter wheat, North Dakota and the other north central states produce Hard Red spring wheat, which is the last wheat harvested in the United States, with the harvest occurring during the late summer or early fall. Both Hard Red winter and Hard Red spring wheats are used primarily for breads. Soft Red winter wheat is produced in Texas and the Great Lakes and Atlantic Coast states, areas with high rainfall. Soft Red winter wheat is low in protein and is used for making pastry, crackers, biscuits, cakes, and similar products.

TABLE 17–7

Top Wheat-Producing Nations, 1992–1996 (million bushels)

Country	1995	1994	1993	1992
China	3,674	3,649	3,909	3,733
India	2,241	2,173	2,102	2,046
United States	2,227	2,321	2,396	2,467
Russia	1,176	1,179	1,598	1,696
France	1,176	1,134	1,075	1,204
Canada	863	858	1,001	1,098
Germany	672	606	579	571
Ukraine	643	510	802	717
Australia	625	332	605	595
Pakistan	614	555	594	576
Turkey	570	540	606	570
United Kingdom	514	489	474	514
Iran	404	404	401	375
Argentina	386	404	356	360
Kazakhstan	386	334	426	672
Poland	320	281	303	271
Italy	294	287	288	328
Romania	257	228	195	112
Yugoslavia	184	198	189	136
Egypt	184	163	176	170
Hungary	173	165	111	127
Denmark	154	136	159	132
Syria	147	118	125	103
Czech Republic	140	141	124	125
Mexico	132	147	132	115
Bulgaria	110	140	133	126
Spain	92	158	184	160
South Africa	81	65	73	48
Slovakia	77	79	56	62
Greece	77	77	44	73

Source: Minnesota Association of Wheat Growers.

TABLE 17–8

Wheat Supply

Type of Wheat	Planting Period	Harvesting Period	Futures Exchange	Producing Area	Use
Hard Red winter wheat (high in protein)	Early September–late October	Early June–mid-July	Kansas City Board of Trade	Kansas, Oklahoma, Nebraska, and Texas	Breads
Soft Red winter wheat (low in protein)	Mid-September–late October	Late June–late July	Chicago Board of Trade	Texas and the Great Lakes and Atlantic Coast states	Pastry, crackers, biscuits, cakes
Hard Red spring wheat, other than durum (high in protein)	Mid-April–late May	Late July–early September	Minneapolis Grain Exchange	North Dakota and other north central states	Breads
Durum wheat	Spring	Late summer–early fall	—	North Dakota, South Dakota, and Minnesota	Pasta products

Another type of wheat, durum wheat, is grown in North Dakota, South Dakota, and Minnesota and is planted during the spring. Durum wheat is used for making a semolina which is especially suited for the manufacture of macaroni, spaghetti, and other pasta products. A small amount of a third type of wheat, club wheat, is also produced during the winter and spring in some parts of the United States. Table 17-9 shows the U.S. production of wheat, by state. Kansas is the major producer of winter wheat and North Dakota of spring wheat.

Wheat is, thus, harvested in the United States during the summer and early fall, with winter wheat harvested during the early summer and spring wheat harvested during the late summer and early fall. Harvesting begins in the southern portion of the wheat belt during the early summer and moves northward as the summer progresses.

In the supply chain in the United States, wheat is usually sold by the farmers to small country elevators, which in turn sell the wheat to large terminal elevators. The terminal elevators typically sell the wheat to millers (who grind it into flour), to other domestic users of wheat, or to port terminals for export. Storage at terminals is usually lowest at the end of a crop year, around May, and highest soon after the beginning of the new crop year. The level of stocks has an important effect on wheat prices.

Wheat is actively traded internationally. The United States has been the world's largest exporter of wheat, with Canada second. Despite its large production, Russia is the world's largest importer of wheat, followed by China and Japan.

Demand The demand for U.S. wheat comes form two sources: exports, which represent about one-half of production, and domestic use. Exports include both commercial exports and exports via government programs. The largest domestic use for wheat is food consumption. For this purpose, wheat is milled into flour for use in making breads, pastries, pastas, and breakfast foods. The use of wheat as a livestock feed is negligible, unless less expensive sources of protein (usually soybean meal) are in short supply.

Price Determinants Although there are many determinants of wheat prices, the major price determinant is worldwide weather conditions, particularly in the world's major producing countries of Russia, China, and the United States. The main reason for the importance of weather is that due to the nature of wheat products as a consumer staple, the demand for wheat products is fairly stable. Thus, supply is the major determinant of price and

TABLE 17-9

Top Wheat-Producing States, 1994–1996 (million bushels)

State	1996*	1995	1994
North Dakota	393.4	300.1	536.4
Kansas	255.2	286.0	433.2
Montana	190.1	195.8	170.6
Washington	182.7	153.8	134.0
South Dakota	130.5	90.7	95.3
Idaho	117.0	103.3	100.3
Minnesota	104.8	71.8	71.3
Oklahoma	93.1	109.2	143.1
Colorado	76.0	105.3	79.7
Nebraska	73.1	86.1	71.4
Texas	69.6	75.6	75.4
Oregon	68.0	63.7	58.6
Arkansas	64.5	47.0	40.5
Ohio	55.4	72.8	68.4
California	53.7	32.7	44.4
Missouri	52.0	48.0	50.4
Illinois	42.9	68.1	50.4
Kentucky	28.0	24.4	25.2
North Carolina	26.6	28.1	30.4
Michigan	26.0	37.2	30.7
Indiana	25.9	39.6	38.4
Tennessee	18.9	16.0	15.0
Arizona	16.7	10.4	11.2
Georgia	16.5	11.4	20.4
Virginia	15.4	17.6	14.0
South Carolina	13.0	9.0	18.0
Maryland	12.5	14.4	12.1
Mississippi	10.6	6.3	6.4
Pennsylvania	10.5	10.2	7.9
New York	7.8	6.9	6.1
Utah	7.6	9.0	7.0
Wyoming	6.8	7.9	5.0
Wisconsin	6.6	8.1	7.9
Louisiana	5.6	2.9	2.6
Delaware	4.4	4.4	3.8
New Mexico	4.1	3.3	5.5
Alabama	3.6	2.9	4.6
Iowa	2.2	1.2	2.1
New Jersey	1.9	1.8	1.3
Nevada	1.6	0.9	0.7

* Indicated September 1996.

Source: Minnesota Association of Wheat Growers.

is usually responsible for imbalances in the demand-supply relationship. Government policies, often weather-induced, also affect wheat prices.

The advent of volatile grain prices occurred during 1974 and 1975 when Russian grain production dropped to approximately 140 million metric tons from over 220 during the previous season. Due to significant Russian imports, wheat prices and the prices of other grains increased significantly. But the U.S. embargo on grain shipments after the Afghanistan imbroglio and a better Russian grain crop sent the prices of wheat and other grains plummeting in 1977. The 1980 drought in the United States increased wheat prices, this time to new highs.

Thus, weather and government policies—government policies at times being a response to the weather—are the primary determinants of wheat prices. Government policies may include stable commercial policies or more irregular, politically induced policies such as embargoes or wars. Some of the stable commercial government policies are discussed below.

Other determinants of wheat prices are:

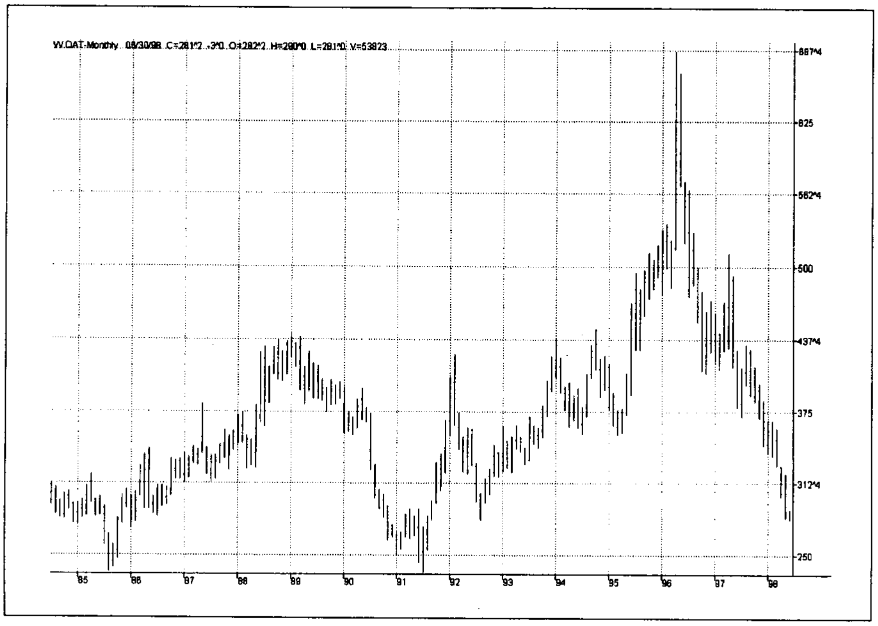
- Exchange rates (For example, recently the strong U.S. dollar has curtailed U.S. exports of wheat.)
- The level of the carry-over of stocks (in either private or government hands) from one crop year to another
- The availability of domestic commercial storage and freight-car facilities (which affects wheat prices in the short run)
- Changes in production or consumption patterns throughout the world, which tend to be gradual

Figure 17-5 shows the price of the CBT futures contract, including the price increases during 1975 due to Russian imports and during 1980 due to the drought in the United States. Since wheat is a worldwide commodity which is significantly internationally traded, wheat prices are internationally determined.

Futures Contracts Four wheat futures contracts are traded in the United States. The largest wheat futures contract is at the Chicago Board of Trade, which began trading during May 1923, on the same day on which the CBT corn futures began to be traded. The contract is based on Soft Red winter wheat (No. 2), a variety grown in the Chicago area. Other types of wheat are also deliverable at par, a premium, or a discount to the standard deliverable. Delivery is made at Chicago, or at Toledo at a discount. The contract is for delivery of 5000 bushels. The MidAmerica Commodity

FIGURE 17–5

Wheat futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



Exchange trades a contract based on 1000 bushels of wheat, but otherwise that contract is identical to the CBT contract.

The Minneapolis Grain Exchange trades a futures contract based on Hard Red spring wheat for delivery at Minneapolis-St. Paul or Duluth-Superior. The Kansas City Board of Trade trades a contract based on Hard Red winter wheat for delivery in Kansas City, Missouri-Kansas. Both contracts are for delivery of 5000 bushels.

All four contracts are traded in the March, May, July, September, and December contract months. Since the harvest begins on July 1, the July futures contract month is the first contract month of the new crop year.

The Winnipeg Commodity Exchange also trades a wheat contract, which is on a 100-tonne broad lot of Canadian wheat (in Canadian dollars), and the London Grain Futures Market trades a contract on 100 long tons (2240 pounds), or approximately 3863 bushels of European wheat (in British pounds).

Pricing of Futures Contracts In general, wheat futures contracts within the same crop year are traded as carrying-charge markets. That is, the price of a distant contract month exceeds the price of a nearby month by the carrying charges between the contract months. Carrying charges include storage, interest, and insurance. However, because of variations in prices and interest rates, the carrying charges between months are not very stable. While wheat futures contracts are not traded precisely as pure carrying-charge markets such as gold, the users of the wheat futures markets are aware of the current approximate carrying charges, which do affect the pricing of the futures contracts.

When a deferred contract is traded at a premium in excess of carrying charges, the market is bullish on long-term prices (or bearish on current prices). In this case, speculators may buy the nearby contract and sell the deferred contract and deliver on the deferred contract. When the deferred contract is traded at a premium that is less than the carrying charges, the market is bearish on long-term prices (or bullish on current prices). In an extreme case, the curve will invert; that is, deferred futures prices will be less than nearby futures prices. This may happen when there is an extreme shortage in the current market.

Speculative Uses Wheat has been a popular speculative commodity since its inception due primarily to the familiarity of the U.S. population with the production and use of wheat. Wheat futures are bought and sold by speculators on the basis of the price determinants discussed above. The increase in the level and variability of international trade in recent years, particularly the variability of imports by Russia, has made weather in foreign countries, which may cause foreign-crop shortages, and the political environment in these countries important bases for speculation. Weather—including rainfall, temperature, and even snowfall—in various parts of the United States is also an important basis for the speculator. The yield of the important winter wheat crop can vary greatly from year to year, depending on the amount of snow cover. When snow cover is light, the danger of topsoil blowing away is serious. Changes in government policies by the United States and other exporting and importing countries are also considered by speculators.

Speculators also trade wheat on a seasonal basis. Since wheat has a normal tendency to reach its low price during harvest time and then rise to a high price after December, when supplies become scarcer, speculators typically build up long positions during and after the harvest as the dealers sell futures to hedge. The speculators then gradually liquidate those positions until the spring as the hedgers buy back their short positions. Speculators are the highest bidders during the harvest and offer at the lowest prices during the winter; thus, they exert a contraseasonal force which tends to eliminate, except for carrying charges, any seasonal price fluctuation in the large and efficient market for wheat.

Several types of spreads are used by wheat speculators. A common type of spread, as in other agricultural products, is the old-crop-new-crop spread. Because July is the beginning of the new crop year, a May–July spread is an old-crop—new-crop spread. New-crop months usually are traded at a premium to earlier old-crop months, but the new-crop months may be traded at a discount if there are expectations of a small demand for or a large supply of the new crop. The old-crop—new-crop spread, thus, represents a speculation on the basis of the price of the new crop relative to the price of the old crop.

One of the favorite spread vehicles for speculators has been the spread of long December wheat versus short December corn. This trade, when the position is put on about June 1 and taken off on November 1, has had a profitable average in past years. This tendency is perhaps the result of both wheat and corn prices declining during the respective harvest periods. Because the wheat harvest occurs during the summer months and the corn harvest during the fall, the speculator putting on the spread typically goes long on wheat during its harvest and simultaneously sells corn before its harvest. The theory is that the hedging pressure in wheat will soon be replaced by the bullish effect of hedge lifting, whereas with the later corn crop, the bearish effect of hedging will be later. This version of the wheat-corn spread is based on their different seasonalities.

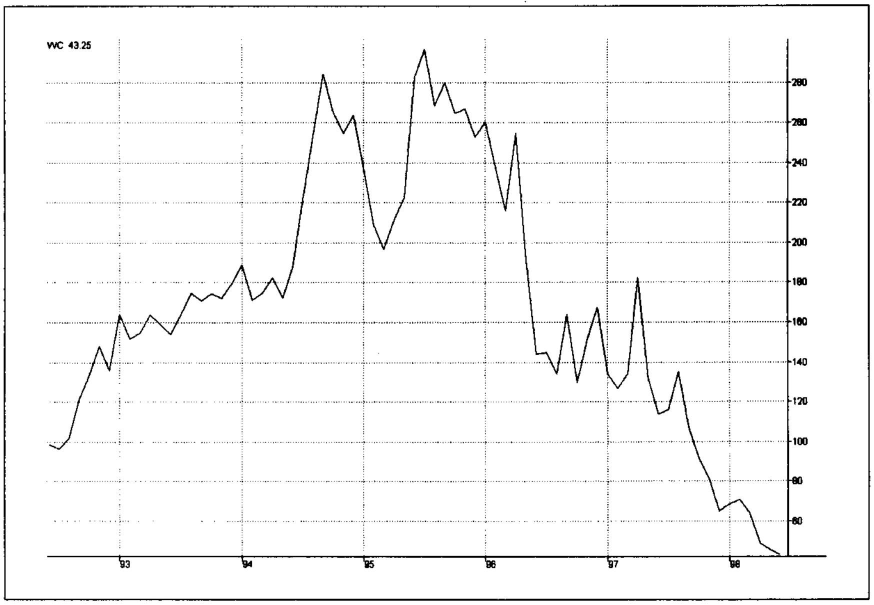
The wheat-corn spread is also a common spread on the basis of the wheat-corn price ratio, independent of their seasonalities. A rule of thumb is that wheat prices should be 115 percent of corn prices. However, as Figure 17-6 shows, there is considerable variation in this ratio.

Intermarket spreads among the Chicago, Kansas City, and Minneapolis contracts may also prove profitable when there is unusual variation in the supply of and demand for the various types of wheat or when a price adjustment is necessary to overcome changes in the costs of transportation from one market to another.

Some international spreaders also spread between U.S. wheat futures contracts and the Winnipeg or British wheat futures contracts—each of these spreads, however, has risk due to exchange rate changes. A correction must also be made for the different sizes of the contracts.

FIGURE 17–6

Wheat/corn spread. Chart created using TradeStation 4.0 by Omega Research, Inc.



Notes from a Trader Fundamentalists sometimes tend to underestimate the difficulty of analyzing the wheat situation. One of the complications is the great number of areas in which wheat is grown. Weather patterns and political developments in all parts of the world and during all seasons have great influence. Countries such as India and Russia may have large surpluses one year and shortages the next. Smaller producers, such as France, Argentina, and Australia, may influence the world market with exports to a degree far beyond what would be expected, given the size of their crops. The use of wheat exports to achieve political ends does not make the analyst's job any easier.

Many traders frequently get trapped by crop scares. Of course, wheat, like all other crops, is sometimes damaged, but more often than not timely rains seem to arrive just about the time that the last speculative long position is established. A common outcome is that a slight damage has occurred in a few scattered areas but the crop is doing beautifully elsewhere. Traders should remember that the type of wheat grown in the

United States is adapted to dry weather and can be hurt by too much rain almost as readily as by too little. An old saw among some wheat growers is "Plant in the dust and your pockets will bust."

Spreads, both old-crop—new-crop spreads and spreads between wheat contracts on different exchanges, are popular as discussed above. While the speculative use of wheat futures, like the commodity itself, is a staple, this use will wax and wane as crop shortages and political activities cause significant variations in wheat prices.

Corn

Introduction Corn is America's oldest and largest crop. The culture of corn originated in Central America or Mexico by native peoples over 7000 years ago. Exactly how it developed is not known, but one of its ancestors is teosinte, which still exists in the wild. Teosinte only vaguely resembles the corn we know; it is much smaller with a head 1 to 3 inches long and few seeds. An ear of modern corn may be 12 inches or more and contain 800 kernels.[2]

Today corn is the largest crop in the United States, with more acreage planted and a higher dollar value than any other commodity. Corn is used primarily as a feed for livestock but, when separated into its components, has over 1000 uses. Corn sweeteners supply over half of the U.S. nutritive sweetener market. Corn is found almost exclusively in nondiet confections, beverages, baked and canned goods, cereals, condiments, medicines, and many other foods. Ethanol is a major refined corn product which is gaining acceptance as a cleaner-burning option for automobiles. Corn byproducts such as starch, oil, and fiber are used in the manufacture of many products, including building materials, paper, paste, diapers, and cosmetics.

Supply Corn is a member of the grass family. Its growth requires fertile soil, a temperate climate, and significant moisture during the growing season. Given these growing requirements, as shown in Tables 17-10 and 17-11, the United States is the world's largest producer of corn by a significant amount, with China second, followed by Brazil, Russia, Romania, and Yugoslavia. As shown in Table 17-12, most corn in the United States is grown in the corn belt, principally Iowa, Illinois, Indiana, Minnesota, Nebraska, Ohio, and Missouri. Corn is the leading agricultural crop in the

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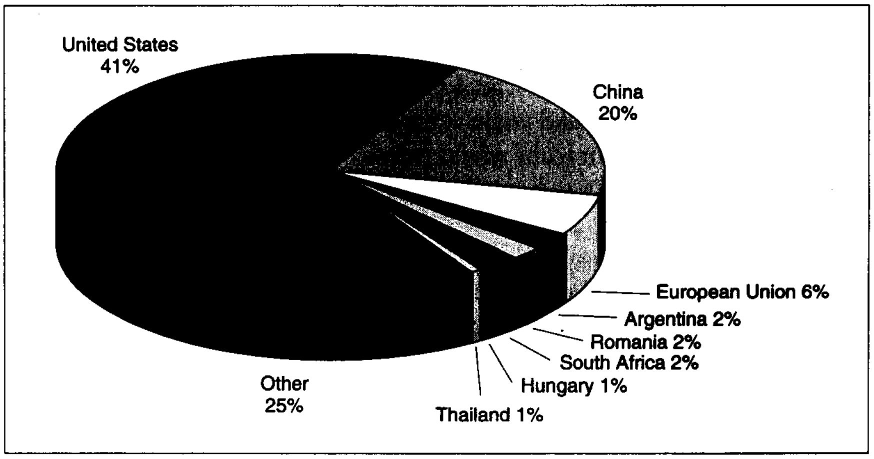
[2] Eileen Watts, The Ferguson Foundation.

TABLE 17–10

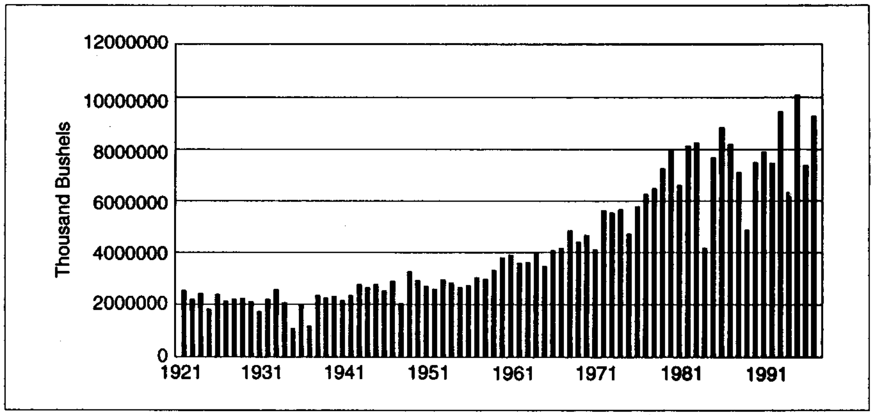
World Corn Production, 1995–1996



Source: *Grain: World Markets and Trade*, December 1996, USDA Economic Research Service and Foreign Agricultural Service.

TABLE 17–11

Total U.S. Corn Production, 1921–1996



Source: USDA/National Agricultural Statistics Service.

TABLE 17–12

Corn Acres Harvested by State, 1996

Acreage (In Thousands)					
Iowa*+	12,450	Colorado*+	940	Oklahoma+	170
Illinois*+	10,800	North Carolina*	900	Delaware	150
Nebraska*+	8,300	North Dakota*+	720	Washington	120
Minnesota*+	6,950	Tennessee+	680	Florida	112
Indiana+	5,450	New York+	630	New Jersey	94
South Dakota*+	3,700	Mississippi+	605	New Mexico	84
Wisconsin*+	3,000	Georgia+	525	Wyoming	50
Ohio*	2,750	Louisiana*	523	West Virginia	40
Missouri*+	2,650	Maryland*+	465	Idaho	40
Kansas*+	2,350	South Carolina+	380	Arizona	40
Michigan*+	2,300	Virginia*+	310	Oregon	33
Texas*+	1,800	Alabama*	280	Utah	21
Kentucky*+	1,200	Arkansas	230	Montana	15
Pennsylvania+	1,070	California	220	Total[‡]	73,147

* Denotes state with corn checkoff.

[†] Denotes state corn organization affiliated with the NCGA.

[‡] Does not include acres harvested for silage.

Source: USDA/National Agricultural Statistics Service.

United States in terms of acreage planted and value of product. In the United States, corn is planted in the spring, between May 1 and June 15, and harvested between early October and late November. October 1, thus, represents the beginning of the new crop year.

There are several different types of corn, classified by the characteristics of the kernel which affect the use. Dent corn, so named because of a dent at the top of the kernel at maturity, accounts for about 90 percent of all corn grown in the United States and is used primarily as an animal feed. Flint corn is harder than dent corn and is used for the same purpose. Sweet corn has a higher sugar content than other types of corn and is used for human consumption. Popcorn has an extremely hard coat, which is why its kernels explode when heated, producing popcorn. Other types of U.S. corn are of minor significance.

Demand Most of the corn consumption in the United States is for animal feed, mainly for beef cattle, hogs, poultry, dairy cattle, and sheep. Thus, the sizes of the livestock and poultry herds are the main determinants of the price of corn. In the past, most corn was fed to animals on the farms that produced the corn. Now, however, corn is also sold to country, terminal, and port elevators for distribution elsewhere in the United States or for export. Storage on and off the farm is typically greatest at the beginning of the crop year, October, and declines until the end of the crop year in September.

Corn also has many other uses. The corn kernel, which consists of hard and soft starch, hull, and germ, is the basis of the corn-refinery industry, which uses a wet-milling process to produce starch. The starch is then used in the paper, textile, laundry, and food industries. Starch is also converted into syrup and sugar for use in the candy and food industries. The conversion of starch into sweeteners such as corn syrup, dextrose, and HFCS (high-fructose corn syrup) for use in soft drinks, candy, and bakery products has greatly increased corn's share of the sweetener market in recent years.

The dry-milling industry produces cereals (such as cornflakes), cornmeal, and other such products from corn. Although corn is not used nearly as much for making bread in the United States as wheat, mainly because corn does not contain the gluten that makes wheat flour rise, corn is used to make cornmeal, which is used in cornmeal mush, johnnycake, tortillas, and other bread substitutes. An increase in the use of dry-processed corn for brewing and industrial purposes also occurs when the price of corn decreases to a level at which corn can compete with barley and rice.

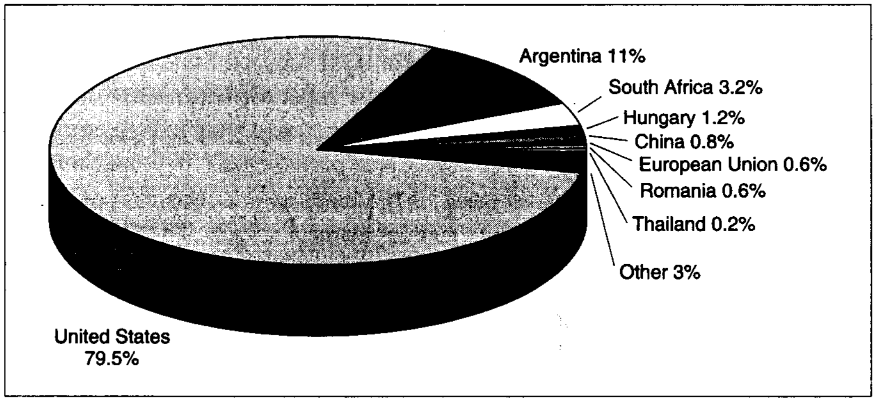
Hominy, which is corn from which the hulls have been removed, is consumed widely in the south in the form of hominy grits. Popcorn is a common product of one type of corn. Corn oil, a by-product extracted from the corn germ, is used as a cooking oil and a base for mayonnaise, salad dressing, and margarine. The use of corn to make alcohol and for seed is relatively small.

Demand Finally, as shown in Table 17-13, the United States is by far the dominant exporter of corn, accounting for over 41 percent of the world trade. Argentina, South Africa, and Hungary are other major exporters of the grain.

Price Determinants The price of corn, through the supply-demand balance, depends on one important supply factor and one important demand

TABLE 17-13

World Corn Exports
1996/1997 Projected Marketing Year Data—October 1 to September 30



Source: *Grain: World Markets and Trade,* December 1996, USDA Economic Research Service and Foreign Agricultural Service.

factor. The supply factor is the weather. Since the United States is the world's largest corn producer and exporter, extremely wet fields during the planting time or the lack of rain during the growing season in the United States significantly reduces the crop yield and causes an increase in corn prices.

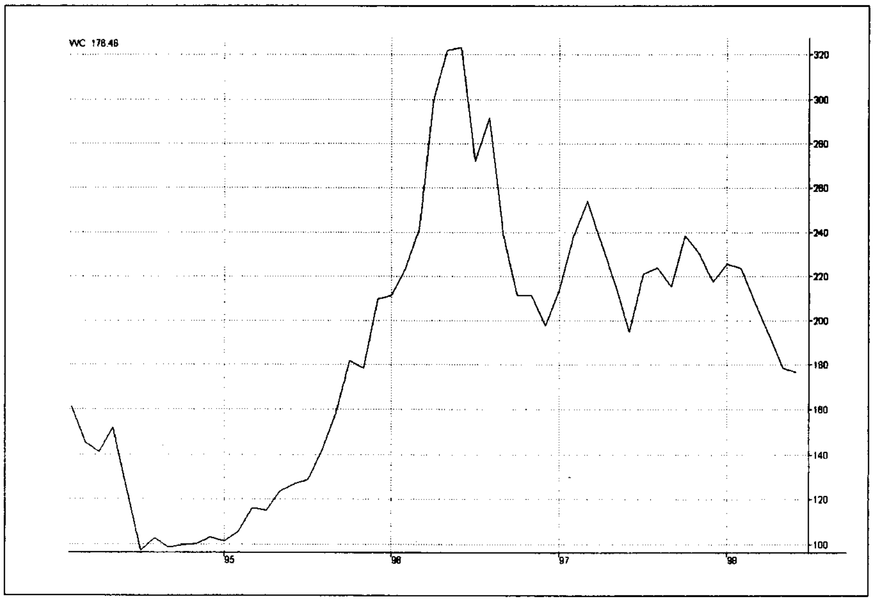
The major determinant of corn prices on the demand side is the size of livestock and poultry herds. Since livestock and poultry feed represents the largest use of corn, large and growing livestock herds in the United States put upward pressure on corn prices.

Other factors that affect corn prices are:

- The size of livestock and poultry herds in other countries.
- The level of production of other corn producers and exporters.
- The supply and price of competing feed grains.
- The relationship between the corn input prices and the prices of outputs of corn, such as hogs, through the corn-hog ratio. The corn-hog ratio, however, is extremely variable in the short run, as shown in Figure 17-7. However, the size of hog herds responds more quickly to changes in corn prices than the size of cattle herds.

FIGURE 17–7

Corn/lean hog spread. Chart created using TradeStation 4.0 by Omega Research, Inc.

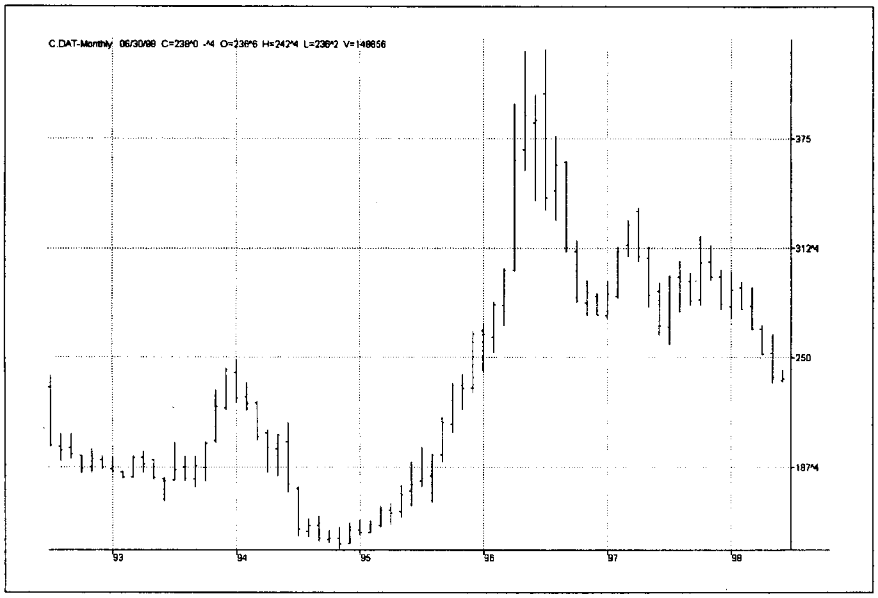


- The relationship between corn prices and the prices of other grains such as wheat, through the wheat-corn ratio. Wheat prices have tended to be about 115 percent of corn prices, but as shown in Figure 17-6, there is considerable variability.
- The carry-over of corn stocks (in private or government hands) to the new crop year.
- The aggressiveness of government price support policies.
- The development of corn substitutes.
- Long-term changes in production methods and consumption patterns for corn or products that use corn as an input.
- Political factors, including embargoes or wars, involving corn-producing, corn-exporting, or corn-importing countries (for example, the Russian grain embargo during 1980 and 1981).

Figure 17-8 shows the CBT corn futures prices in recent years. The same price increases that occurred in 1980 for corn also occurred for soybeans and wheat for the same basic reasons.

FIGURE 17–8

Corn futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



Government Policies There are several government programs, some fairly complicated, designed to support farmers and farm prices. These programs involve, in effect, purchasing grains and other agricultural products from farmers, restricting the acreage planted, and/or other actions.

A common program is the government loan program. According to this program, each year the government sets two prices, a loan price and a trigger-level release price. When the price of the agricultural product is below the loan price, the government will lend the farmer an amount equal to this price at a subsidized rate of interest for 9 months, and the farmer will release the crop to the Commodity Credit Corporation (CCC). The purpose of the loan is to permit farmers to repay basic operating costs but sell the crop later if prices increase. This movement of the crop into the loan decreases the free-market supply and causes the crop price to remain at approximately the loan level. At the end of 9 months, the farmer has three choices. He or she can repay the loan plus interest, surrender the crop to the CCC with the interest forgiven, or enter into a reserve loan program.

Under the reserve loan program, in turn, the farmer receives a 3-year loan for a given amount per bushel and agrees to store the grain for 3 years or until the grain price reaches a specified trigger-release level. During this time, the government pays the farmer a storage charge. If the grain price, however, reaches the trigger-release level, the farmer may repay the loan plus interest and withdraw the grain from the loan program. At the end of the 3-year program, the farmer can repay the loan plus interest, surrender the crop to the CCC, or renew the program for 2 more years. At the trigger-release level, farmers typically withdraw their grain from the loan program and sell it, and the government will also sell its holdings—this level, thus, usually establishes a ceiling on the grain price. Other government policies affecting grains include an optional acreage reduction program (ARP) and a payment-in-kind (PIK) program.

Futures Contracts Corn futures contracts are traded at the Chicago Board of Trade and the MidAmerica Commodity Exchange. The CBT corn futures contract began to be traded in May 1923, on the same day the CBT wheat futures contract began to be traded. The only difference between the two contracts is in the size of the contracts, with the former contract being for 5000 bushels and the latter for 1000 bushels. Both contracts are traded in the March, May, July, September, and December contract months, with December being the first month of the new crop year. Both contracts are based on No. 2 yellow corn for par delivery in Chicago and for delivery at a discount in four other cities.

Pricing of Futures Contracts Corn, much like wheat, is traded as a modified carrying-charge market. If stocks are large, deferred contracts will sell at premiums equal to or in excess of full carrying charges (storage, interest, and insurance). However, if corn is scarce, deferred contracts will sell at small premiums or even at a discount to the nearby contract. In this case, prices are likely to rise. New-crop months are usually traded at a premium to earlier old-crop months, although the new-crop may be traded at a discount if it is believed that there will be a large supply. These relationships are consistent with a commodity trader's old proverb: "Buy discounts and sell carrying charges."

Speculative Uses Corn futures can be bought or sold on the basis of the fundamental determinants of corn prices described above. Speculation in corn based on weather and government policies has been common by those in the agricultural sector.

In addition, the same types of spreads can be done for corn as for wheat. A common type of spread is the old-crop—new-crop spread. Corn is also spread against other grains. As mentioned above, the corn-wheat spread has been a common type of spread on the basis of different seasonals or different fundamental price determinants of corn and wheat. Another type of intermarket spread is the corn-hog spread, based on the relationship between the price of corn, an input, and hog prices, the output.

Speculative Uses The CBT corn futures contract has a larger open interest than any other commodity futures contract. Speculators account for a significant portion of this open interest.

Oats

Introduction Oats are a cereal grass; they grow in cool, temperate climates and can even grow in poor soils. Their ability to grow in subpar conditions is one reason that oats are grown in every state in the contiguous United States.

Oats are used primarily for livestock feed. They are high in mineral content and in several vitamins, especially the B-complex. Formerly largely fed to work horses, oats are now used as feed for dairy cattle and hogs. Oat hulls from milling are used in poultry mash. Oat straw is more nutritious and palatable than wheat straw and is important as a supplementary feed on many farms.

Less than 5 percent of total U.S. oat production is used for human consumption. For food use, the groat or inner kernel is rolled into flakes and used as oat meal in breakfast foods and baking. Oat flour is also mixed with wheat flour in the production of multigrain bread products.

Supply Oats are produced in most countries in the world. Russia is the largest producer of oats in the world, as shown in Table 17-14, followed by the United States, West Germany, Canada, and Poland. The production of oats, both worldwide and in the United States, declined through the 1970s. Recent U.S. production has been at its lowest levels since the 1880s. The reason for the decline in the United States is the shift of acreage from oats to other higher-value crops.

In the United States, as shown in Table 17-15, the leading oats-producing states are South Dakota, Minnesota, and North Dakota. Most oats produced in the United States are white oats, although red and gray oats are also produced. Oats in the United States are planted in the spring,

TABLE 17–14

World Production of Oats (thousands of metric tons)

Crop Year	Argen- tina	Aus- tralia	Canada	China	Den- mark	France	Ger- many	Italy	Poland	Spain	Sweden	Turkey	United Kingdom	United States	Former U.S.S.R	World Total
1981–2	339	1,617	3,188	1,700	176	1,774	3,200	422	2,731	445	1,806	325	620	7,391	15,000	45,343
1982–3	637	848	3,637	1,660	178	1,802	3,777	359	2,608	443	1,663	330	575	8,602	15,500	47,866
1983–4	593	2,296	2,773	1,650	86	1,374	2,489	307	2,377	464	1,268	310	465	6,923	17,000	45,115
1984–5	610	1,367	2,670	780	150	1,892	2,973	433	2,604	780	1,904	300	516	6,875	19,200	48,391
1985–6	400	1,339	2,997	664	152	1,803	3,278	363	2,682	719	1,668	314	615	7,559	20,500	50,062
1986–7	400	1,584	3,251	599	111	1,007	2,687	397	2,486	433	1,486	300	505	5,608	21,929	47,471
1987–8	650	1,738	2,995	642	94	1,045	2,406	361	2,428	502	1,440	310	450	5,454	18,495	43,270
1988–9	451	1,867	2,993	670	202	984	2,941	383	2,222	537	1,330	300	545	3,158	15,287	37,506
1989–90	620	1,640	3,546	622	125	970	2,010	296	2,186	494	1,455	270	530	5,423	14,972	39,554
1990–1	434	1,530	2,692	685	121	830	2,104	298	2,119	512	1,584	270	550	5,189	15,081	39,042
1991–2	400	1,690	1,794	650	125	740	1,867	359	1,873	410	1,426	280	545	3,534	12,342	32,785
1992–3	450	1,937	2,823	640	93	700	1,314	333	1,229	320	807	280	525	4,298	13,974	33,587
1993–4	440	1,652	3,550	640	150	710	1,730	370	1,500	400	1,295	280	500	2,994	14,422	35,162
1994–5*	350	920	3,640	600	—	680	1,660	360	1,240	—	990	300	600	3,320	13,850	33,160
1995–6†	350	1,940	2,860	640	—	620	1,420	310	1,500	—	950	280	600	2,350	10,690	28,970
1996–7‡	320	1,600	4,380	650	—	600	1,600	300	1,500	—	1,130	250	—	2,250	11,230	31,440

* Preliminary.

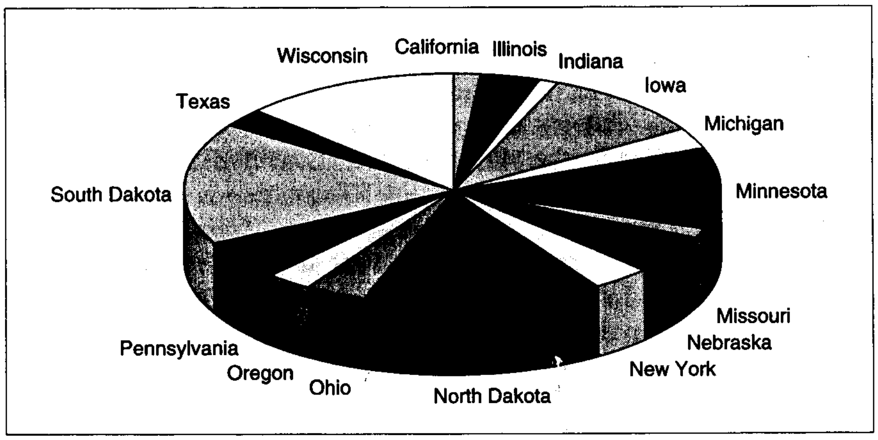
† Estimate.

‡ Forecast.

Source: Foreign Agricultural Service, U.S. Department of Agriculture.

TABLE 17–15

Production of Oats in the United States



Source: National Agricultural Statistics Service, U.S. Department of Agriculture.

between early April and late May, and are harvested between mid-July and late August.

Demand Oats are used mainly as a livestock feed. Most oats are consumed by livestock on the producing farm. Oats are excellent for feeding horses, breeding animals, young stock, and poultry. A major reason for the decline in the production of oats is the decline in the number of horses and mules employed as work animals. As a livestock feed, oats have the highest protein among cereal grains and are also high in carbohydrates.

Price Determinants Since oats are used primarily as an animal feed, the number and mix of the livestock and poultry fed are primary determinants of oats prices. In addition, the price of competing feed grains, particularly corn, affects oats prices. A bushel of oats weighs somewhat more than one-half as much as a bushel of corn. On the basis of relative feeding values, a bushel of oats is worth somewhat more than one-half as much as a bushel of corn. Overall, by weight, oats usually sell at 85 to 90 percent of the price of corn. Thus, the corn-oats price ratio is a determinant of oats prices.

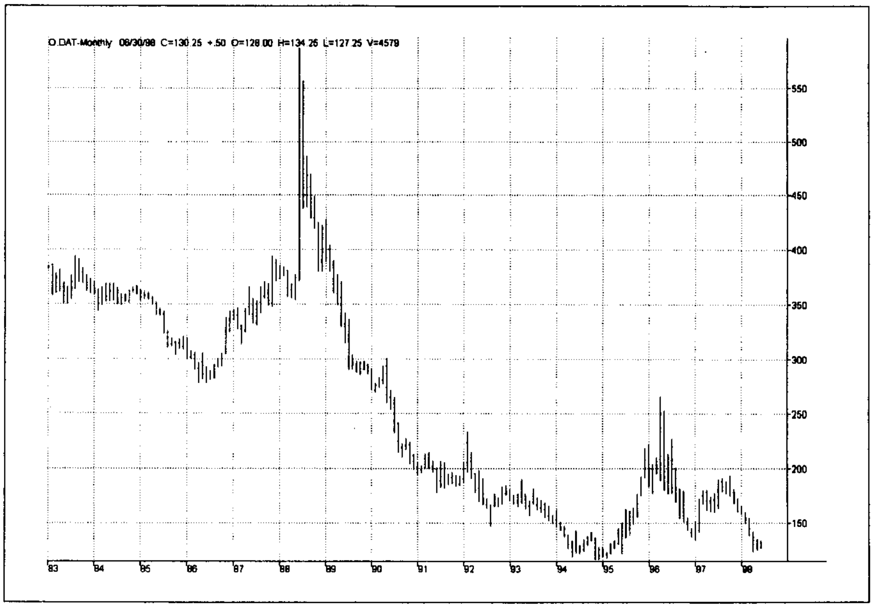
Because of the ability of oats to withstand cool weather, the annual oats supply is less subject to bad weather than many other feed grains.

However, the carry-over of oats, including the stocks at terminals, affects oats prices. Government programs also affect the price of oats. The PIK program for corn also resulted in the use of oats as a cover on corn acreage. Figure 17-9 provides the price of the CBT oats futures contract in recent years.

Futures Contracts Futures contracts based on oats are traded on the Chicago Board of Trade, the MidAmerica Commodity Exchange, and the Winnipeg Commodity Exchange. The CBT contract is based on 5000 bushels of oats delivered via warehouse receipt from warehouses in Chicago at par or at Minneapolis or St. Paul at a 7½-cent discount. The trading months are July, September, December, March, and May. Given the timing of the harvest period, July is the first contract month of the new crop. The MCE contract is for 1000 bushels, but is identical to the CBT contract in every other way.

FIGURE 17–9

Oat futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



The Winnipeg Commodity Exchange contract is based on the delivery of a 100-tonne broad lot, 20-tonne job lot of Canadian oats at Thunder Bay, Ontario. The contract is traded in Canadian dollars.

Speculative Uses The speculative uses of oats are similar to those of corn. The corn-oats price ratio is an important basis for intermarket spreading. Because the corn harvest is later than the oats harvest, a buy oats–sell corn spread through the oats harvest period has often been used. The speculative use of the oats market tends to be much less than uses of futures contracts based on the soybean complex, wheat, and corn.

Notes from a Trader—Corn and Oats The enormous size of the corn crop and the substantial volume of corn hedging produce a futures market which seems to be somewhat ponderous at times. Moves are usually slow, turns are rounding, and the market can absorb relatively large orders without reacting violently. The corn futures market is a popular market for the relatively new speculator because there is less risk of large sudden adverse moves than in most other markets. Some, however, have called the corn futures market a "sleeping giant" because when it begins to move, it can go further than expected, and occasionally its movements are sharper than what traders are used to experiencing.

When the U.S. corn crop is compared with the corn crops of other countries, its overwhelming size is evident. But that does not mean that the crops of other countries are not without influence. For example, Argentina's importance is out of proportion to the size of its crop because it sells a high percentage of its production into world trade rather than as domestic feed.

Many traders, in attempting to analyze corn, forget that it is basically a feed grain and that many substitutes other than the obvious soybean meal and oats are available. Sorghums of various types are grown in great quantity but are overlooked by many traders because they are not traded heavily on domestic exchanges.

For both corn and oats, weather, particularly at certain times of the year, can be extremely important. In the case of corn, for example, subsoil moisture is usually entirely exhausted by the middle of July, and rain from that time until the middle of August may be critical to avoid severe damage. Too much rain, however, during the same period can prevent storage because of the crop's excess moisture, and the result may be crash marketing and low prices. Conversely, continuing rain can even postpone the harvest until the fields dry, and this postponement is another cause of short-term tightness.

Even worse, the rain may be followed by an early frost, which can severely damage the wet corn and the bank accounts of those who had been selling corn because they regarded the rain as bearish. Late drought may appear bearish, but it may have a beneficial effect if it arrives after the corn crop is made and serves only to dry the corn and the fields. Oats mature earlier than wheat and are not as hardy. They need adequate moisture and may be severely damaged by hot weather near the end of their growing season.

The oats market performs more like a thin market than one would expect from the apparently large crop. One reason is that the small size of a bushel of oats is sometimes forgotten—the crop is not as big as it appears. Furthermore, the oats market is sometimes dominated by a few large trade houses, and so its response to small speculative activity may be greater than had seemed likely.

In spreading oats against corn, most traders regard one contract of corn as equivalent to two contracts of oats, but large traders should keep in mind the thinness of the oats market to avoid suffering a loss greater than expected. Liquidity is seldom a problem in the popular corn-wheat spread, but it may be one for those who choose to spread Chicago oats, particularly a maturing contract of oats, against a more distant contract.

Sources of Information—Wheat, Corn, and Oats

The USDA provides substantial invaluable information on the U.S. grain markets. The USDA *Wheat Situation* report, issued during March, May, August, and November, provides information on supply, demand, disappearance, stocks, prices, government policies, and foreign aspects of the wheat markets. *Winter Wheat Seedling,* issued during late December, supplements these reports. The USDA *Feed Situation* report, published during February, April, May, August, and November, and the weekly USDA *Feed Market News* provide additional information on the grain markets. The USDA weekly, *Grain Market News,* provides more timely information on all aspects of the grain markets, including government activities.

Stocks in All Positions, published quarterly (January, April, July, and October) by the USDA, provides information on stocks and disappearance by location. The weekly *U.S. Export Sales Report,* issued by the USDA Foreign Agricultural Service, and the USDA publications *Foreign Agri-*

culture and *Weekly Roundup of World Production and Trade* provide data on export sales.

The USDA *Hog and Pigs* report (March, June, September, and December), *Cattle on Feed* report (monthly for seven states), and *Livestock* and *Meat Situation* reports also provide information on the uses of grains.

Among the other relevant USDA publications are:

Planting Intentions—mid-January and mid-April

Prospective Planting report—March 15

Crop Production report—monthly, on the 10th of the month

Annual Summary (of crop production)—third week in December

Eggs, Chickens, and Turkeys report—monthly

The trade publication *Feedstuffs* also provides information on feed demand. *Banking News,* a weekly trade publication, provides substantial information on wheat from planting to utilization.

The *Annual Report* and other publications of the CBT provide significant information on the cash and futures markets for grains. Finally, the CFTC provides information, including its *Commitments of Traders in Commodity Futures.*

CANADIAN MARKETS

The last group of agricultural products covered in this chapter trades on the Winnepeg Commodity Exchange (WCE). The WCE trades via a mechanism that is similar to the techniques used by U.S. futures exchanges, as opposed to forward markets traded on the London exchanges. All contracts listed on the WCE are traded in Canadian dollars. Three products will be discussed—flaxseed, canola, and barley.

Flaxseed

Introduction Flaxseed has been grown since prehistoric times. The main type of flaxseed (also known as linseed) is an oilseed that, like soybeans, is crushed to produced oil and meal. Linseed oil is used as a drying oil in outside paints and varnishes, as a printing ink, and as an oil for linoleum and other industrial products. Linseed meal, which usually has a protein content of more than 4.2 percent, is an important supplement in livestock and poultry feed.

Supply Canada is currently the largest producer and exporter of flaxseed. The biggest crushers of flaxseed include Argentina, China, India, and the United States. Canadian flaxseed, the basis for delivery on the WCE futures contract, is grown in three prairie provinces—Alberta, Saskatchewan, and Manitoba, as shown in Table 17-16. It is generally sown in May and June and harvested in September and October. Flaxseed is grown in temperate climates in drained sandy loam.

Futures Contract A futures contract on flaxseed is traded at the Winnipeg Commodity Exchange for delivery in October, December, March, May, and July. October is the first month of the new crop year. The trading unit is a 100-tonne broad lot, 20-tonne job lot. Delivery is at Thunder Bay, Ontario. The standard weight of flaxseed for delivery is 56 pounds per bushel. Figure 17-10 shows the futures prices of this contract in recent years.

Canola

Introduction Canola is the name given to the edible strain of rapeseed. The plant is related to the turnip family, hence its name (*rapum* is Latin for turnip). Canola has been used since ancient times, as both a lamp oil and in cooking. The commercial production of canola did not accelerate, however, until the development of the steam engine. During World War II, the oil was found to cling to water, and its importance increased as a lubricant for marine vessels.

TABLE 17–16

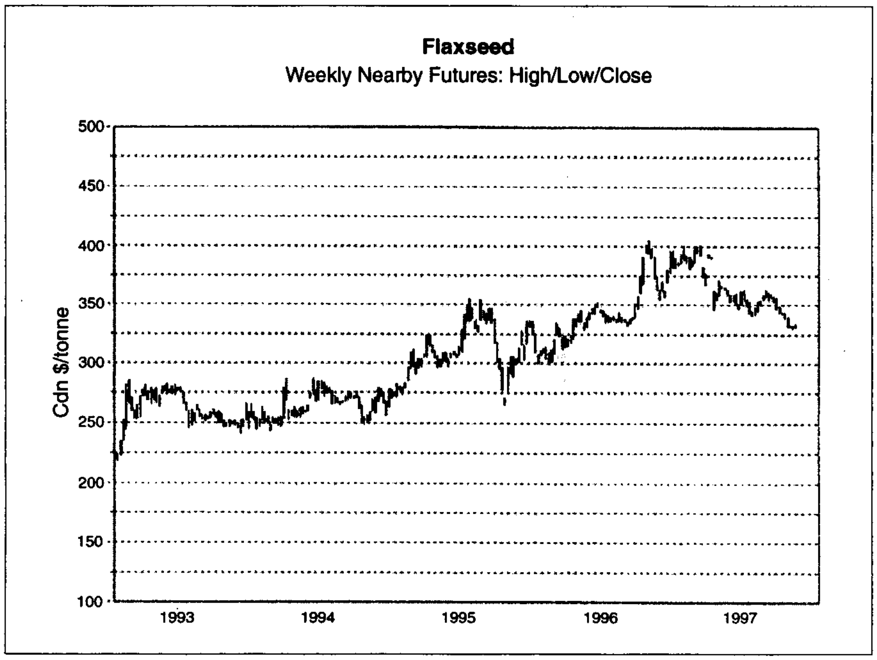
Production of Flaxseed, by Province, Canada (thousand tonnes)

Year	Manitoba	Saskatchewan	Alberta	Total
1991	330.2	266.7	38.1	635.0
1992	208.3	109.2	19.1	336.6
1993	243.9	342.9	40.6	627.4
1994	373.4	546.1	40.6	960.1
1995r	403.9	647.7	53.3	1104.9
1996p	350.0	472.5	20.3	842.8

Source: Flax Council of Canada.

FIGURE 17–10

Flaxseed futures, 1993–1997.



Edible canola oil is low in two substances found in unimproved rapeseed—erudic acid and glucosinolates. These two substances are toxic to both humans and livestock. In 1985, the U.S. Food and Drug Administration approved canola as an edible oil. Prior to FDA recognition, only about 15,000 metric tons of canola oil were imported in the United States. In 1986, 1 year after the FDA ruling, U.S. imports had risen to 150,000 metric tons and, in 1991, reached 350,000 metric tons. One of the main reasons for the popularity of canola oil is its composition low in saturated fat—in fact, canola has the lowest saturated fat content of any edible oil. Since saturated fats have been shown to increase cholesterol levels, canola oil has gained popularity in the health-conscious United States.[3] Like soy-

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[3] L. O. Copeland, "Nontraditional Field Crops: Canola/Rapeseed and Lupins." Many MSU Extension data bases are available on CD-ROM or in other formats. For more information about this data base, please contact: cook@msue.msu.edu

bean, canola has both a high protein (28 percent) and high oil (40 percent) content. When the oil is crushed out, a high-quality and highly palatable feed concentrate of 37 percent remains.

Supply Canada is the largest producer of canola (see Table 17-17). The European Economic Community is also an important producer, especially France. Most of Canada's production is in the three prairie provinces; originally it was mainly in the northern areas of these provinces, but there is increasing production in the southern provinces. Canadian canola may be seeded in either the fall or the spring, depending on the severity of the winter. Spring planting, the more common type, occurs in May and early June. The harvest occurs from August through October. The United States produces less than 1 percent of the world's supply, mostly in Minnesota and North Dakota. The average yield is 40 bushels of canola per acre. Soils that produce the highest yields for wheat will do the same for canola.

TABLE 17–17

Canadian Canola Production and Prices

Year	Acreage (000 acres)	Average Yield (tonnes/acre)	Production (000 tonnes)	($/tonne)
1982	4,390	0.485	2,246.00	314.36
1983	5,767	0.523	2,609.30	347.57
1984	7,388	0.482	3,427.90	451.95
1985	6,925	0.530	3,497.90	357.57
1986	6,523	0.592	3,713.70	268.68
1987	6,600	0.600	3,719.50	268.63
1988	9,075	0.486	4,218.30	245.30
1989	7,175	0.447	3,209.20	310.98
1990	6,380	0.512	3,265.90	302.14
1991	7,760	0.544	4,224.20	277.01
1992	7,895	0.467	3,688.80	293.44
1993	10,270	0.521	5,350.10	325.19
1994	14,325	0.505	7,227.90	382.54
1995	13,160	0.501	6,586.20	428.78
1996	8,997	0.553	5,036.60	440.36

Source: Statistics Canada.

Demand Canola oil usage continues to grow faster than any other cooking oil in the developed world. Of the two major supply areas, Canada and the European Economic Community (EEC), Canada is already nearly at the limits of its viable canola production acreage, and the EEC has instituted a new subsidy system which pays growers based on acreage rather than production. This is expected to result in an 8 to 10 percent decrease in world canola production in the next few years. Rapid production increases in the United States and Argentina should quickly compensate for any shortfall. However, U.S. production would have to increase tenfold just to meet domestic demand.[4]

Canola meal, which has a protein content of over 40 percent, is a valuable supplement in livestock and poultry feed. Japan is the largest importer of canola meal.

Futures Contract The Winnipeg Commodity Exchange trades a futures contract on rapeseed for the delivery months of January, March, June, September, and December. September is the first month of the new crop year. The size of the contract is a 100-tonne broad lot, 20-tonne job lot for delivery in Vancouver, British Columbia, with alternative delivery points in Saskatchewan and Alberta. The standard weight of rapeseed for delivery is 50 pounds per bushel. Figure 17-11 provides the recent prices of this futures contract.

Barley

Barley is a cereal grain and a member of the grass family. It is high in crude protein, making it an important component to feed grain. Table 17-18 compares the nutrient composition of barley and other grains.

Supply Russia is the world's largest producer of barley. Other major producers of barley are the United States, Canada, the United Kingdom, France, and China. During the last several years, the world's production of barley has been fairly stable, although previously barley production had increased. Australia, Canada, and France are the major exporters of barley. Russia, Japan, Europe, and Poland are major importers.

Barley is the most versatile of the cereal grains—it can be grown in all climates, from subarctic to subtropic due to its shorter growing season

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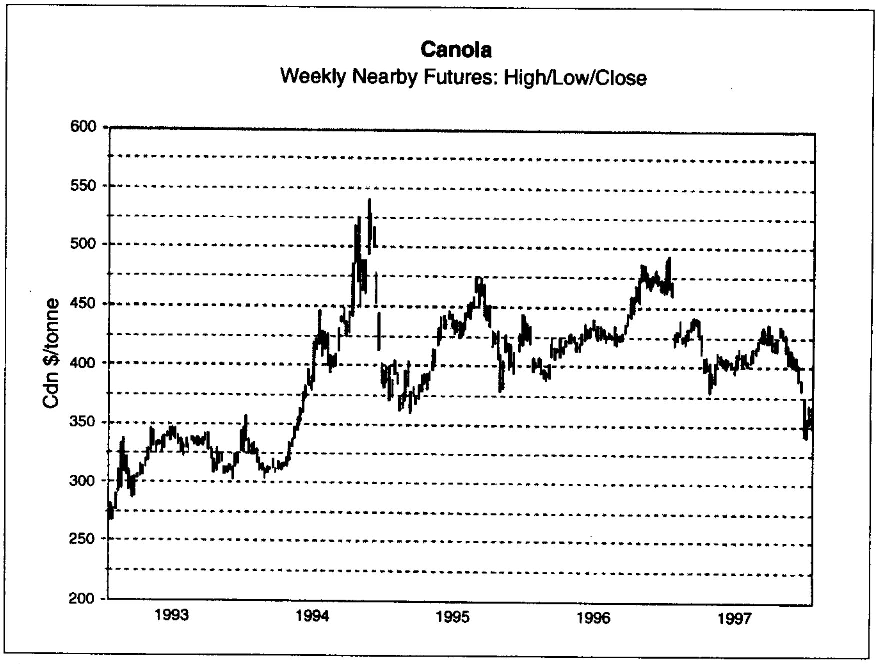
[4] Ibid.

FIGURE 17-11

Canola futures.



and its greater tolerance to cold and heat. In Canada, where the barley deliverable on the WCE is grown, seeding occurs during May and the harvest occurs during August. Barley and wheat compete in their demands on acreage in Canada.

The level of production and the price of barley are related to the level of production and the price of other feed grains, such as corn and sorghum. Barley, as a substitute for corn, is usually traded at a price that is approximately 80 percent of the price of corn. The price of barley for malting in beer has been adversely affected, however, by the increased consumption in the United States of light beers, which require much less malt. Malting barley continues to sell at a premium of up to $1 a bushel relative to the price of feed barley.

Demand Unlike wheat, barley is used chiefly as an animal feed, mainly for hogs and increasingly for cattle. Another significant use of barley is as

TABLE 17–18

Comparative Nutrient Composition of Barley and Other Grains

Nutrient (as fed)	Barley	Hulless Barley	Corn	Wheat	Rye	Sorghum
Dry matter, %	88	88	88	88	88	88
Crude protein, %	11.5	13.2	8.8	13.5	12.1	11
ADF, %	6	2	3	4	—	9
Crude fiber, %	5	1.4	2.2	2.6	2.2	2.3
Test wt kg/hl whole	62	—	74	76	—	54
Test wt kg/hl ground	40	—	56	62	—	50
Fat, %	1.9	2	3.8	2.2	1.5	2.9
Ash, %	2.3	—	1.4	1.7	1.9	1.8
TDN, %	74	76	78	78	74	73
NE maint, Mcal/kg	1.76	—	1.97	1.94	1.81	1.79
NE gain, Mcal/kg	1.19	—	1.36	1.34	1.23	1.21
NE lact, Mcal/kg	1.71	—	1.78	1.82	1.71	1.62
Bypass protein, %	28	—	50	25	20	55
Lysine, %	0.43	0.5	0.21	0.35	0.4	0.27
Swine DE, kcal/kg	3140	3350	3450	3430	3280	3415
Meth + cys, %	0.42	0.56	0.3	0.51	0.36	0.3
Tryptophan, %	0.18	0.15	0.09	0.15	0.14	0.09
Phosphorus, %	0.34	0.35	0.26	0.37	0.32	0.29

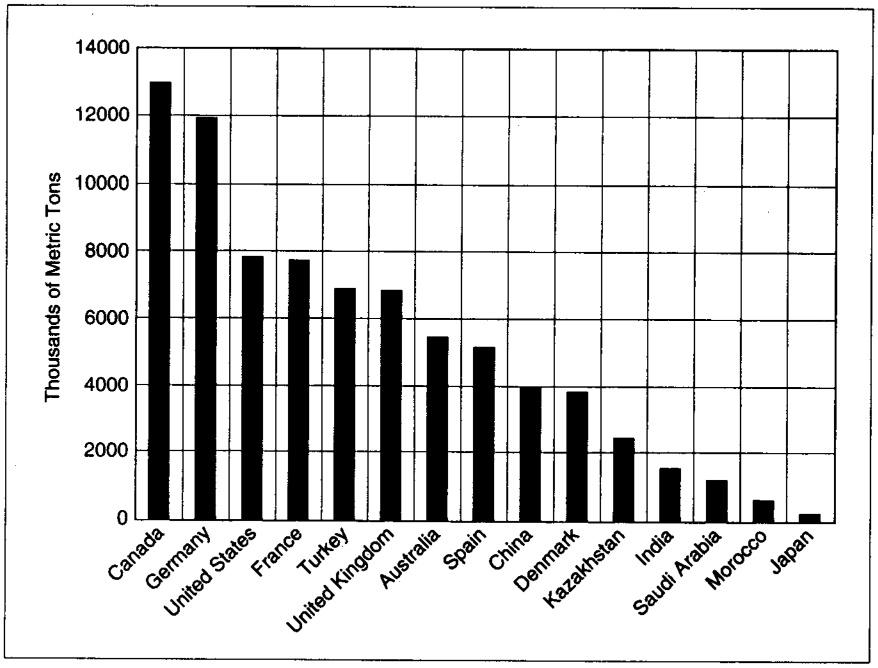
Source: D. Hickling, Canadian International Grains Institute.

a malt in beer and other alcoholic beverages. In the United States, one-third of the use of barley is in alcoholic beverages. In Asia and Africa, barley is used as a food, for soup and barley flour. Barley has a minor food use in the United States. Table 17-19 shows information on major barley producers.

Futures Contract A futures contract based on barley is traded on the Winnipeg Commodity Exchange for delivery during October, December, March, May, and July. The October contract is the first contract of the new crop year. The contract size is a 100-tonne broad lot, 20-tonne job lot for delivery in Thunder Bay, Ontario. Figure 17-12 provides a plot of the prices of this futures contract during recent years.

TABLE 17–19

World Barley Production



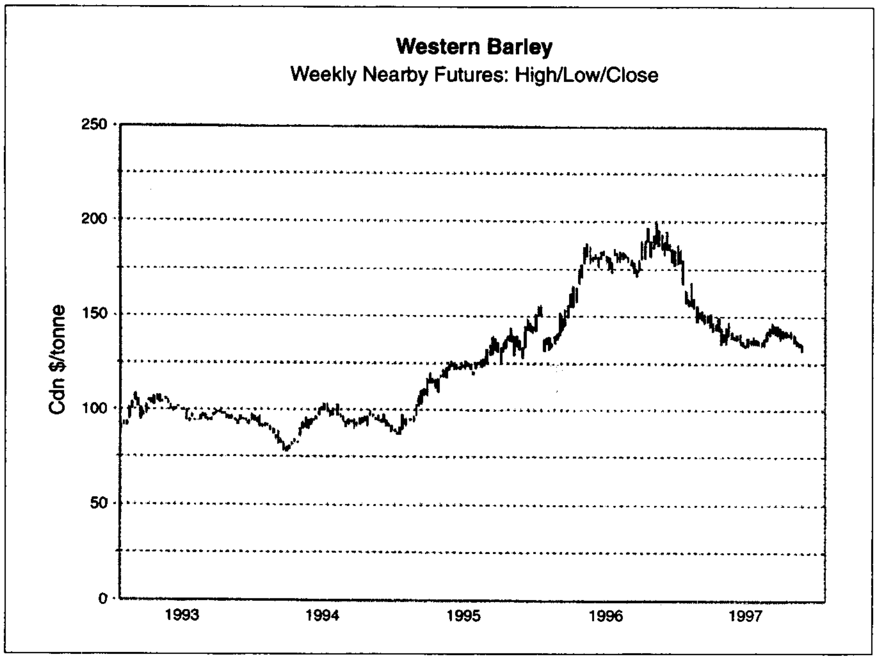
Speculative Uses of Canadian Futures Contracts

The speculative uses of the four contracts traded exclusively on the Winnipeg Commodity Exchange are similar to the speculative uses of the oil and grain futures contracts on the U.S. futures exchanges. These include time spreads, including old-crop—new-crop spreads, and intermarket spreads, including spreads against competing oilseed and grain futures contracts.

Two aspects of these four contracts make them different, however, from the contracts on U.S. futures exchanges. First, the trading volume on these four contracts is typically substantially less than on related contracts on the U.S. markets, and so the markets are much thinner. Thus, price moves can be much greater in response to smaller fundamental reasons. Second, the major producers of commodities for delivery on the four Canadian contracts are, in most cases, other countries, so conditions in other countries can have a much greater effect on the prices of these commodities than on soybean, wheat, and corn prices. Rye, in particular, is basically a European crop, and the much smaller Canadian crop is very thin.

FIGURE 17-12

Barley futures, 1993–1997.



Sources of Information—Canadian Markets

An important source of information on the Canadian markets is the Winnipeg Commodity Exchange (678 Grain Exchange Building, Winnipeg, Manitoba, Canada R3B OV7), which trades the commodities. Among other publications, the exchange's *Quarterly Summary* is particularly useful.

The Canadian government also provides useful information. The Canadian Grain Commission, Statistics Branch (280 Grain Exchange Building, Winnipeg, Manitoba, Canada R3B OT6), provides the publication *Statistics.*

The Dominion Bureau of Statistics (Ottawa, Canada) provides *Crop Reports and Estimates,* and the Agriculture, Fisheries and Food Products Branch, Department of Industry and Trade (Ottawa, Canada), provides general information. Finally, the Sanford Evans Service Limited (P.O. Box 6900, Winnipeg, Manitoba, Canada R3C 3B1) provides an *Annual Summary* on these markets.

Notes from a Trader—Canadian Markets

Those who trade flax and rapeseed for the first time after some experience in corn and wheat may have to revise their ideas about price movements and ranges. The great price volatility in these commodities sometimes makes close stops almost meaningless. Spreaders between old and new crops may find one or even both sides of their spreads in unusually thin markets, which can lead to the disorderly execution of market or stop orders. Partial rather than complete fills of limit orders are not uncommon.

Both flax and rapeseed are sometimes, but not always, responsive to European oil prices. In the case of both commodities, oil is usually a more important end product than solids or fibers. Flax tends to be quite responsive to weather conditions in Saskatchewan, Manitoba, and Alberta, particularly to dryness in July. Trends, particularly in flax, are long and strong. Those who like to probe against markets for tops or bottoms may do well to try elsewhere.

Those who trade rye should realize that it is basically a European crop and that the smaller Canadian market is quite thin. This might produce problems where liquidity is important, especially in the case of liquidation under adverse conditions.

There are three important reasons for the volatility of the rye market: (*a*) the crop is small, and a relatively small change in the supply-demand balance will often have significant price consequences; (*b*) there is a smaller amount of hedging pressure and trade buying than with most other grains; and (*c*) because the rye market is relatively thin, rye prices often fluctuate more than the prices of the other grains.

18 CHAPTER

The Meat Futures Contracts

The price of pig,
Is something big;
Because its corn, you'll understand,
Is high-priced, too;
Because it grew
Upon the high-priced farming land.
If you'd know why
That land is high,
Consider this: its price is big
Because it pays
Thereon to raise
The costly corn, the high-priced pig.

—*H. J. Davenport*

This chapter discusses the futures contracts based on livestock. It is divided into the beef complex, which includes live cattle, feed cattle, and ground beef, and the pork complex, which includes lean hogs and pork bellies.

THE BEEF COMPLEX

Introduction

Throughout the history of the United States, the U.S. cattle industry has played an integral role in the country's growth and economic well-being. As the largest segment of U.S. agriculture, the cattle industry includes approximately 1.23 million businesses. An estimated 1 million farmers and ranchers raise cattle.[1]

Cattle have a long tradition in the United States. Christopher Columbus brought the first cattle to the Americas in 1494, on his second voyage to the New World. Cattle production is a family business generally passed from one generation to the next. Only 1.9 percent of beef ranches are owned by corporations, and most are family corporations with fewer than ten stockholders. Over two-thirds of all cattle in the United States are owned or managed by beef producers with fewer than 500 head of cattle[2] (see Table 18-1). The production of beef by state is shown as Table 18-2.

The production of beef in the United States uses more land and creates more market value than the production of any other livestock or grain crop in the country. In most years, the cattle and calves sold for beef produce as much income as wheat, corn, soybeans, and cotton combined. Beef production also accounts for the single greatest use of feed.

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[1] National Cattlemen's Association.

[2] American Meat Institute.

TABLE 18-1

Size Distribution of U.S. Beef Producers

Size	Market Share
1,000+ head	22.7%
500–900 head	11.1%
100–499 head	38.5%
50–99 head	14.1%
1–49 head	13.6%

Source: National Cattlemen's Association.

TABLE 18–2

Top Ten Beef-Producing States

State	Value of Market Cattle ($ billions)	Number of Businesses
Texas	6.35	147,000
Nebraska	4.71	29,000
Kansas	4.37	36,000
Colorado	2.24	13,000
Iowa	2.21	45,000
Oklahoma	2.13	62,000
California	1.53	25,000
South Dakota	1.50	22,000
Minnesota	1.09	38,000
Missouri	0.87	75,000

Source: National Cattlemen's Association.

Beef is sold almost exclusively for human consumption. The major inputs in beef production are calves, land, feed grains (especially corn), and capital.

Supply

The production of beef requires the breeding and raising of cattle. Because different names are used for cattle of different sexes at different stages of development, it is useful to summarize this terminology prior to discussing the supply chain. The appropriate terms and their definitions are as follows:

Cow. A mature female that has had a calf.

Heifer. A female that has not yet produced a calf (and is under 3 years of age).

Bull calf. A male calf, not yet castrated.

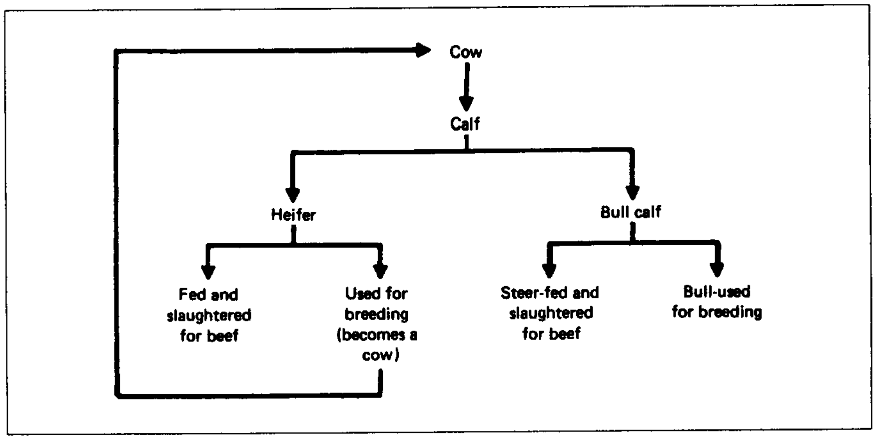
Steer. A castrated male.

Bull. An uncastrated male, capable of reproduction.

Yearling. A calf that has been fed on pasture for approximately 1 year.

FIGURE 18-1

Cattle cycle.



The relationships among these types of cattle are summarized in Figure 18-1. Figure 18-2 shows the timing of various aspects of the cattle cycle. The most important times in the cycle are as follows:

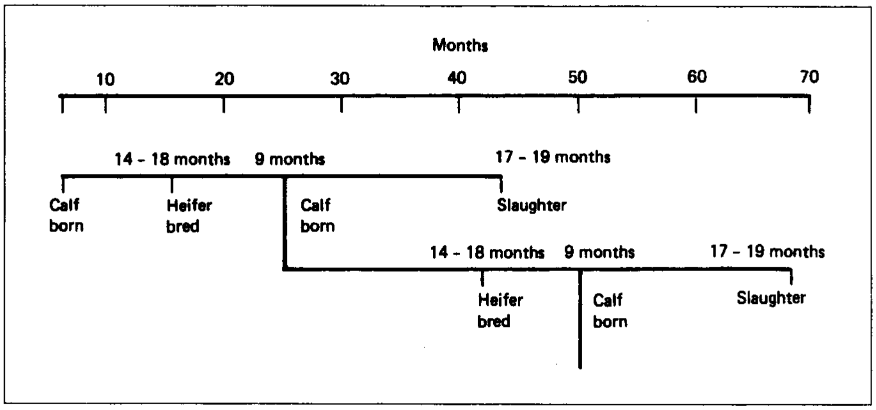
- There are 14 to 18 months between when a heifer calf is born and when the heifer is bred.
- The gestation period for a calf is 9 months; that is, it takes 9 months after the heifer is bred before the calf is born.
- There are approximately 17 to 19 months between when a bull calf is born and when the fed steer is slaughtered.

There are three sectors of the cattle industry. The first is the ranch, also called the cow-calf operation, which produces calves, or feeder cattle. The second is the feedlot, or cattle-feeding, sector, which produces fat cattle, or slaughter cattle, from feeder cattle. The third is the packer, which produces beef from fed cattle. In the United States, the breeding of cattle occurs mainly in the grazing and pasture areas from the Rocky Mountains on the west to the western edge of the corn belt states on the east and, north to south, from Canada to Texas. The cattle are then shipped to feedlots in the feed-grain production areas in the corn belt and sections of Texas and Oklahoma.

Cow-Calf Operation The purpose of the cow-calf operation is to produce calves. These calves are produced by using breeding cows, a small number

FIGURE 18–2

Beef production cycle. (U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, February 1979.)



of bulls, and a large amount of forage land. The size of the operation varies considerably, but a typical number of breeding cows is 75, with 1 bull per 20 cows. Depending on the rainfall and the resulting greenery of the land, it may require from 4 to 200 acres per cow-calf combination.

The cow herd is usually bred in the late summer, and the calves are, given the 9-month gestation period, born the following spring. This cycle provides good weather for the calf's infancy and better forage for the calf's early grazing. Calves remain with their mothers for approximately their first 6 months, with all their nourishment coming from nursing. After 6 to 8 months, the calves are weaned, that is, removed from their mother's milk, and during the last part of the weaning they are fed increasing amounts of grass and grain. Weaned calves usually weigh 350 to 500 pounds.

Although some weaned calves are immediately sent to feedlots, most go through an intermediate stage called the "stocker operation," wherein they are fed summer grass, winter wheat, or some other type of roughage. This phase lasts approximately 6 to 10 months, after which time the animals weigh 650 to 800 pounds and are called yearlings—these yearlings are also called feeder cattle (calves that go directly to the feedlot are also often called feeder cattle). At this time, the animals are ready to go to feedlots. It is such yearling feeder cattle that are the basis for the feeder cattle futures contract. The stocker may be part of the cow-calf operation or may be in a different business—in the latter case the stocker may either buy the calves from the cow-calf operation or simply receive a fee for the feeding services.

As discussed below, the cow-calf sector is the driving force of the cattle cycle. Decisions made by the rancher regarding herd size determine the number of calves that will be produced later, the number of cattle ready for slaughter, and the beef supply. The most important decision made in the cow-calf sector is the number of calves that are held back from feeding. In stable times, about 20 percent of all the breeding cows in each breeding cycle must be replaced due to the failure to conceive. Thus, if out of 100 cows, 20 must be replaced, then 20 out of the 80 calves born, or 25 percent, must be used to replace the cow herd. However, if due to rising beef prices cattle herds are being expanded (the accumulation phase of the cattle cycle), more than 25 percent of the calf crop will be withheld and fewer calves will reach feeding; thus, temporarily, even more upward pressure will be put on beef prices. During the liquidation phase of the cattle cycle, when cattle herds are being contracted due to low beef prices, the retention rate for calves with regard to feeding is lower, and more calves will reach feeding; thus, temporarily, more downward pressure is put on beef prices.

Another factor which affects the size of the cow herd is the rate of cow slaughter, independent of the percentage of conception. When reducing the size of the cow herd is desired due to decreasing beef prices, the rate of cow slaughter will increase, further decreasing beef prices. The opposite will occur during times of increasing beef prices. Cow slaughter represents a substantial source of the domestic supply of ground and processed beef. Thus, both the rate of cow slaughter and the rate of calf or heifer retention affect the current and future size of the cattle herd.

Since the profit margin of cow-calf operations is often small and these operations are very land-intensive, the appreciation of the grazing land represents an important source of profitability to this sector.

The Feedlot The feedlot, or cattle-feeding, sector turns feeder cattle into fed cattle ready for slaughter by keeping the cattle in pens and feeding them high-protein feed for rapid weight gain. Both steers and heifers are placed in feedlots, although more steers are placed due to the heifer retention necessary to maintain cow herds. Cows are not usually placed in feedlots prior to slaughter. Usually steers are fed until they weigh 1000 to 1200 pounds and heifers until they weigh from 850 to 1000 pounds before slaughter.

In earlier years, feeder cattle were typically fed only on pasture before slaughter. However, the economics of beef production, due to increasing land values and the costs of capital and also consumer preferences for leaner beef, have made feedlots the main location for producing slaughter cattle—feedlots produce heavier and leaner slaughter cattle. The feedlot is, thus, a rather recent sector of the cattle industry.

Feedlots are divided into two types by size. Farmer feedlots are defined as having a capacity of 1000 head or fewer at a time. Feedlots with larger capacities are called commercial feedlots. There are important differences between these two types. Although over 95 percent of all feedlots are farmer feedlots, they account for less than 25 percent of total fed-cattle sales due to their smaller size. In addition, although essentially all cattle on farmer feedlots are owned by the farmer, almost 50 percent of the cattle on a commercial feedlot are owned by someone other than the owner of the feedlot. Separate ownership of the cattle and the feedlot is called *custom feeding,* which shifts the price risk of fed cattle from the feedlot to the owner of the cattle (that is, the "customer" of the feedlot).

Another difference is that farmer feedlots also produce most of their feed, while commercial feedlots purchase essentially all their feed from feed producers. Partially as a result, farmer feedlots use more roughage and less protein concentrate than commercial feedlots. Thus, the feeding practices and the results of feeding of the two feedlots are very different. The major differences are as follows:

- The farmer feedlot has a lower ratio of pounds of feed per pound of gain.
- The farmer feedlot has a lower ratio of pounds of gain per day than does the commercial feedlot.
- Farmer feedlots keep cattle on feed longer than do commercial feedlots.

Extremely hot or cold weather decreases the efficiency of feeding by all three measures for both farmer and commercial feedlots.

The feed used by feedlots is a combination of grain, protein supplement, and roughage. The grain component is usually corn, milo, or, at times, wheat when wheat prices are low. The protein supplement is usually soybean, cottonseed, or linseed meal. The roughage is usually alfalfa, silage, prairie hay, or some other local roughage, such as a derivative of sugar beets.

The choice of feed depends on the relative prices of each type. The feeder compares the cost of adding a pound of weight gain with the price of beef on the market. Thus, since corn is always a major component of the feed, the ratio of the price of corn to the price of beef is an important indicator of the profitability of the feedlot. If feed prices decrease or fed-cattle prices increase, the cattle will be kept on feed somewhat longer to a somewhat heavier weight, and vice versa. Obviously, any widening between the price of feeder cattle, the major input to the feedlot, and the price of slaughter cattle due to imbalances in their supplies will also increase the profitability of the feedlot sector.

Because approximately 10 pounds of grain is required to produce 1 pound of beef, transportation costs are lower if feedlots are located near where feed is produced and the cattle are transported to the beef markets than if feedlots are located near the beef markets and the grain is transported to the feedlots. As a result, since most feed is grown in the corn belt and plains states, most feedlots are now located in these states, with the trend toward the corn belt states, where feed is more abundant and cheaper.

The Packer The packer purchases fed cattle, slaughters them, and sells essentially every part of the slaughtered cattle. In recent years, packers have located their slaughterhouses near the feedlots where slaughter cattle are produced, which, as indicated above, have been increasingly located in the corn belt states rather than near the markets for beef. Earlier in the history of beef, packers located their slaughterhouses near the primary market outlets, which were also terminal markets. At that time, most fed cattle were marketed through these terminal markets.

Many other fed cattle were marketed through auctions near the feedlots, which, in earlier times, were near either where the calves were produced or the markets for beef. Recently, however, commercial feedlots have been selling about 90 percent and farmer feedlots over 60 percent of their fed cattle directly to packers. The importance of terminal markets and auctions has, thus, decreased significantly in the marketing chain for fed cattle.

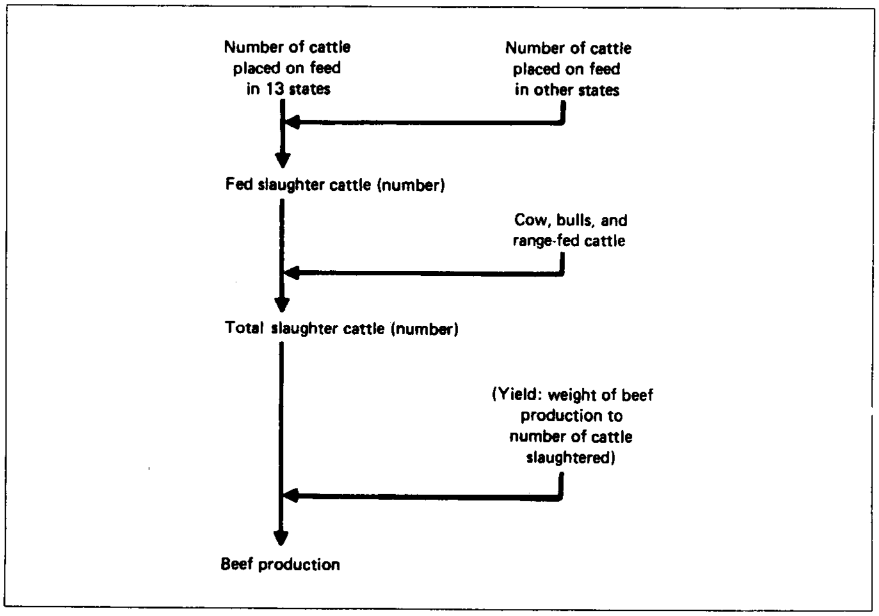
The packer has two major sources of revenue: the sale of beef, either in carcass form or in boxed form, and the sale of hide and offal or drop (hide, trimmed fat, variety meats, bones, blood, glands, etc.). The packer buyer can determine the value of slaughter cattle from the value of beef and its byproducts. To do so, the packer buyer must estimate the dressing percentage (the carcass is usually approximately 62 percent of the live weight), the quality grade (prime, choice, good, etc.), and the yield grade (1 to 5, with the higher grades indicating a lower fraction of merchantable retail cuts in the carcass) of the slaughter cattle. For example, a 1000-pound choice yield grade 3 may produce a 650-pound carcass which yields 495 pounds of salable beef. About 50 to 55 percent of the carcass is sold as steaks and roasts, 5 percent as stewing beef, and the remainder as hamburger.

The Pipeline Method One way to consider the supply of beef and, thus, predict the price of beef is through a pipeline approach in which the various stages of beef production are considered as parts of a pipeline and the inputs to and outputs of the pipeline are analyzed at various stages in the pipeline. U.S. government data on the inputs and outputs are used. Each quarter, the USDA estimates the number of cattle put on feed in the 13 major cattle-feeding states. This figure, with some subjectivity, can be translated into forecasts of fed slaughter cattle, total slaughter cattle, and beef production two quarters later, since, as indicated above, the typical length of feeding is almost two quarters.

Figure 18-3 summarizes this method of forecasting beef production and the potential errors in the forecast. At the first step of the forecast, states other than the 13 major states account for approximately 13 percent

FIGURE 18-3

Cattle pipeline approach.



of cattle placed on feed, and this fraction varies. At the next level of the forecast, fed steers and heifers account for only about 70 percent of the total, with cows, bulls, and range-fed steers making up the remainder. Finally, the yield of slaughtered cattle averaged about 630 pounds per animal from 1979 to 1983, but this yield also varies. From the number of placements in the 13 states, however, the beef production two quarters later can be estimated with a margin of error. Of course, the USDA also publishes data on fed cattle, slaughter, and beef production with which these earlier forecasts can subsequently be compared.

The Cattle Cycle The production of cattle, hence beef, differs from the production of most other farm products because of the existence of a distinct, fairly regular, long-term cyclical variation in the number of cattle produced. This cyclical change in the size of the cattle herd is called the *cattle cycle.* There have been seven cattle cycles since 1896, averaging about 12 years in length but ranging from 9 to 16 years and comprising, on the average, 7 years of herd expansion and 5 years of herd contraction.

There are several reasons for the cattle cycle. One reason is the life span of the cattle themselves. As indicated above, it is over 2½ years from the time a cow is bred until steak is produced from its offspring. Another reason is the heavy investment required to enter most phases of the cattle business. Changes in the demand for beef and changes in the availability and cost of feed also influence the cattle cycle. For example, a severe drought is almost certain to cause a reduction in herds, whereas abundant feed supplies coupled with low herd numbers encourage an increase. Good grazing conditions encourage producers of feeder cattle to hold back their stock. Feedlot operators will be willing to pay more for the yearlings if feed grains such as corn are abundant enough to ensure reasonably low feed prices. The fundamentalist wishing to analyze the factors affecting the cattle cycle can use some ratio between the price of cattle and that of feed. The cattle price used could be the average farm selling price of choice steers. It might also be necessary to consider both corn- and range-fed cattle by combining a cattle-corn ratio and a cattle-hay ratio, assuming that the price of hay measures pasture conditions for range-fed cattle.

The expansion phase of the typical cattle cycle begins when producers decide to expand their breeding stock in response to rising prices or expectations that prices will rise, and the prices of breeding stock then accordingly begin to rise because the latter are held back to expand the herds. Cows, heifers, and heifer calves are all withheld to be used for herd expansion, and calves, yearlings, and steers are withheld to be fed (finished) to an older age and a heavier weight. When the larger numbers of new calves from the expanded herds mature, slaughter begins to increase because fully finished steers must be marketed regardless of the stage of the cycle. Prices then begin to fall, and marketing becomes still heavier. Prices then begin to break, the liquidation phase of the cycle begins, and prices fall even more, by the greatest amount for breeding stock and the least for high-grade fed cattle. The slaughter of cows and calves is then increased because herd expansion is no longer considered desirable, and this fact depresses cattle prices even more. Finally, herds become so small that prices begin to firm, cattle producers realize that the bottom of the cycle has been reached, and the expansion of the number of cattle is ready to begin again with the rise in steer prices coupled with the increasing scarcity of cow beef as cows are again held back for breeding. As indicated, both the expansion phase and the liquidation phase may last for years, with the buildup typically requiring considerably more time than the liquidation.

One of the early signs of an impending expansion in the number of cattle is the withholding of cows, calves, and heifers from slaughter so that they can be used for rebuilding herds. This creates an interesting problem for packers and consumers. Cow prices fluctuate more than steer prices, and cow meat is used for lower-priced products such as hamburger and sausage meat. Just when consumers are ready to switch to such low-cost substitutes from higher-priced cuts of beef, they find that their prices are increasing proportionately more than the prices of more expensive cuts.

There are consistent relationships between the phase of the cattle cycle and both the slaughter weights of steers and the cost of feeding. These relationships are expressed by the beef-corn price ratio. When cattle feeders become sufficiently optimistic to begin accumulating cattle, the average live weight of steers begins to rise because they are withheld to be finished to heavier weights. The rise in cattle prices usually tends to be more rapid than the accompanying rise in feed costs, and feeding to heavier weights remains profitable, even though the most economical weight gains take place in young animals and the conversion efficiency ratio declines sharply as animals become heavier. Feeders who wait too long find themselves withholding their cattle and seeking higher prices at a time when the cycle is in its liquidation phase, and they may then have difficulty recovering even the cost of production. At this point selling may assume almost panic proportions.

The relationship between the phase of the cattle cycle and beef and cattle price changes should also be noted. While the relationship is somewhat weak, prices tend to begin rising during the latter part of the contraction and continue to rise until cattle prices have risen sufficiently to make cattle breeding, raising, and feeding once again profitable, at which time the contraction ends and the expansion begins. Then, as the expansion continues and reaches a mature stage, the herd becomes overbuilt and prices tend to peak and begin to decrease.

Two measures are suggestive of the phase of the cattle cycle. One is the ratio of breeding cows to people. A ratio of 24 cows per 100 people has been considered an equilibrium level, with a higher ratio interpreted as an indication of oversupply and an impending contraction. The ratios of cattle and calf slaughter to either the total cattle inventory or the previous year's calf crop are also used as indicators of oversupply. If either ratio is below its accepted equilibrium level (0.36 and 0.85, respectively), the interpretation is that the slaughter level is too low, the cattle herd is building too quickly, and prices will soon decrease.

The price relationships of the varying grades of cattle also vary over the cattle cycle. When marketing is light, the price premium for high grades tends to be highest because cattle are coming out of feedlots at lighter weights. When prices begin to decrease in response to increasing supplies, feeders extend the feeding period of more cattle to heavier weights, and the early stage of liquidation may be indicated. This retention of some of the lighter cattle so that they can be fed to heavier weights reduces the relative scarcity of the heavier higher grades of beef, and the premium narrows. When marketing becomes heavy, feeders may have to market their heavy cattle at low prices and lose money.

Cattle on feed may be owned by packers, chain retailers, speculators, farmer feeders, commercial feeders, or ranchers, with farmer and commercial feeders dominating. Many cattle in custom feedlots are fed for absentee owners under contract. The cattle drives so popular in movie westerns have been replaced by less romantic assembly-line tactics. The range cowboy, the small cattle ranch, and the small feedlot have all declined significantly. The stockyards in the big cities have also felt the changing times. Because of the spiraling costs of transportation and feed, as well as the decreasing supply of grassland, the trend has been toward large, mechanized feedlots in order to achieve such benefits of size as volume buying. In warm areas, cattle may be kept in shaded pens provided with sprinkler systems to reduce temperatures and settle the dust. Special diets have been developed for hot regions. Large lots maintain their own feed-mixing mills, and many have developed their own formulas. Many feedlots, especially in the far west, are geared toward producing the popular choice grade of beef. The prime grade, preferred by more expensive restaurants, is becoming increasingly scarce.

Much of the risk in the cattle business is absorbed by the owners of cattle on the cow-calf operations or on feedlots. Once the owners are committed to producing or feeding calves or yearlings, they have little choice but to bring their animals to a marketable weight, regardless of the fluctuations of cattle or feed prices. In addition to the costs of inventory and feed, they must pay for transportation, marketing, taxes, administration, shrinkage, labor, insurance, repairs, veterinary services, and interest. To reduce the risk, some lots sell their cattle some months in advance of their being finished, with provisions for a price adjustment in accordance with the actual condition of the cattle when delivery time arrives. This selling may be by agreement or via the futures markets.

Producers of calves, feeder cattle, or fed cattle face a classic economic capital budgeting decision. Due to the production lag, they must make an investment on the basis of current and expected costs of inputs and expected output prices. The price they receive for their output depends on the price of beef at the time of their sale, which is several months later due to the production lag for both feeder cattle and fed cattle, as indicated above. Important input prices are the prices of corn and feeder cattle for producers of fed cattle and the price of corn for producers of feeder cattle. Weather conditions affect the supply and price of corn and, to a lesser extent, the supply and price of feeder cattle. Thus, for given beef prices, the lower the price of corn or feeder cattle, the more cattle will be placed on feed, since there will be an expected increase in the profitability of producing fed cattle. This future increase in supply will lead to an increase in the supply of beef, which will, in turn, mitigate the degree of price increase. However, there are potentially countervailing factors. For example, lower corn prices will cause the demand for and price of feeder cattle to increase, which will, to some extent, mitigate the degree of price increase for fed cattle. Lower corn prices will also increase the price of feeder cattle relative to the price of fed cattle, thus affecting the relative profitabilities of these two sectors.

A second important aspect of supply is that since there are mor ranches than feedlots and more feedlots than packers, the degree of concentration increases up the production chain; thus, producers tend to be price takers rather than price makers. A third aspect of supply is that beef and cattle, unlike most grains, are perishable. When ready for production, they can be stored for only a short period of time. Thus, since supply cannot be stored for sale at a later time, excesses or deficiencies in supply affect prices quickly and significantly.

Demand

The United States is the only beef-producing country that has a commercial feeding sector to produce high-quality, grain-fed beef. In fact, the United States produces nearly 25 percent of the world's beef with less than 10 percent of the world's cattle. Japan is by far the largest importer of domestically produced, grain fed beef (see Table 18-3).

According to the USDA, virtually all Americans—99 percent—eat meat, and 94 percent eat red meat. Contrary to popular opinion, consumers are eating more meat than ever. Total per capita consumption of meat has increased by 16 pounds over the past decade. The average American eats 125 pounds of red meat per year.[3]

Price Determinants

As for any other commodity, the price of beef and, thus, the price of fed cattle, feeder cattle, calves, and cows depend mainly on supply and

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[3] American Meat Institute.

TABLE 18–3

Largest Importers of U.S. Beef

Market	Amount ($ billions)	Percent of Total Exports
Japan	1.57	65
Canada	0.36	15
Mexico	0.16	6.8
South Korea	0.15	6.7
Total Beef Exports	2.42	

Source: USMEF.

demand. In turn, the two factors that affect supply are production costs and, to reverse the causality, beef prices. The production costs of fed cattle are determined mainly by the price of feed and feeder cattle; feed accounts for approximately 30 percent and feeder cattle approximately 56 percent of total production costs. Decreases in either of these costs, with beef prices constant, would stimulate beef production.

Some indicators of supply, mentioned above, are as follows. The size of the cow herd is an indicator of beef available one year later. As indicated, the number of cattle on feed by weight category and the number placed on feed are shorter-term indicators of beef supply. The beef-corn price ratio, which affects the number of cattle on feed and the length of the feeding period, also affects the beef supply. On a very short-term basis, the number of fed cattle marketed is an important indicator of beef production.

Interest rates also affect the cost of production through their effect on land-financing costs, which influence the production of feeder cattle, and their effect on fed-cattle prices due to the capital intensity and the relatively long feeding time for producing fed cattle. Finally, weather can also affect supply. For example, drought can affect range and pasture conditions and the quality and availability of feeder cattle. Weather conditions also affect the price of feed for feedlots and, directly or indirectly, through the length of the feeding period, the timing of the supply of fed cattle. Good or bad weather, even at the time of marketing, can affect the number of cattle marketed at the time and the short-run price of cattle.

Several factors affect the demand for beef. The first is personal income. While a rise in income usually translates into a smaller increase in the demand for food than for other items, the demand for beef, especially high-quality beef, has usually responded more quickly to a rise in income than the demand for most other foods. An increase in population also causes an increase in the demand for beef, but increases in population occur slowly and predictably enough that population increases do not affect beef prices significantly.

The second factor influencing demand is often called "taste." Taste is, unlike consumer income and other determinants of demand, very subjective and not measurable—it refers to how well consumers like a product and is independent of all other influences on demand, including price. That is, the greater the taste for a product, the more of the product the consumer will purchase, even at the same price. Taste may affect the seasonal demand for some goods; for example, during the Thanksgiving season, the demand for turkey increases and the demand for beef decreases.

Since the late 1970s, there has been a secular decrease in the demand for the fatter cuts of beef in the United States, probably due to greater health consciousness. In response to the demand from a majority of consumers for beef that is healthful, palatable, and lean, many beef producers have begun to initiate changes in breeding practices. Geneticists and animal nutritionists in the last decade have altered patterns of development of livestock so that growth of muscle mass and minimization of fat deposition has lead to larger-framed, more muscular animals.[4] Retail beef outlets have also responded to changing market conditions. In the last 10 years, trimmable fat has been reduced by 27 percent, more than 40 percent of retail beef cuts have no external fat, and the fat content of ground beef has been reduced 10 percent.[5]

Finally, the prices and supplies of beef substitutes also affect the demand for beef. Since pork and chicken are also sources of animal protein, their prices and supplies affect beef demand and prices. Because of the substitutability of beef with pork and chicken, when the prices of pork and chicken decrease relative to beef prices, the demand for beef decreases, and vice versa.

As with the demand for most other farm products, the demand side of beef is dominated by a few buyers, whereas there is a large number of suppliers. Public demand is expressed to an important degree by the buyers for large packing houses and grocery chains. All beef produced will be consumed quickly at some price because of the limited storage facilities. Because demand is less volatile than supply in the short run, the current market price depends heavily on the available supplies of beef in relation to those of competitive meats. In the ultimate response to the public's demand for beef, ranchers buy breeding stock, grain farmers buy feeders, packing houses buy fat cattle, and retailers buy sides of beef.

Exports and imports are of relatively little importance in the analysis of cattle prices. Imports of beef are comparatively small because of shipping costs, although the United States does import some beef from countries such as Australia, New Zealand, Argentina, Ireland, Mexico, and Canada. Some live cattle are also imported from Canada and Mexico. The United States is a net exporter of beef products such as tallow, grease, and hides. It also exports a small amount of beef, primarily to Canada.

Figures 18-4 and 18-5 show the prices of the Chicago Mercantile Exchange live cattle and feeder cattle futures contracts.

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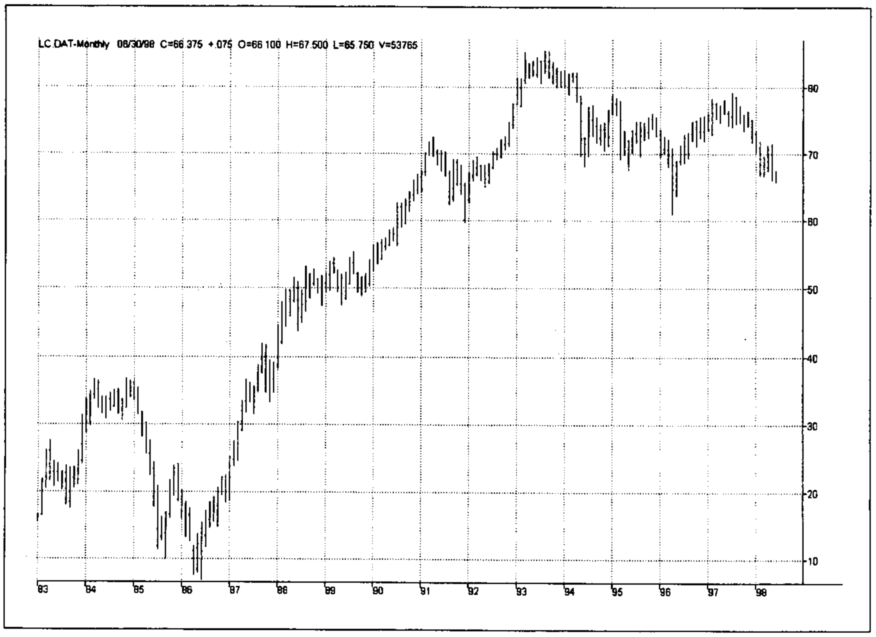
[4] Eileen Watts, Ann Ferguson Foundation.

[5] National Cattlemen's Association.

FIGURE 18-4

Live cattle futures, 1984–1997. Chart created by TradeStation 4.0 by Omega Research, Inc.

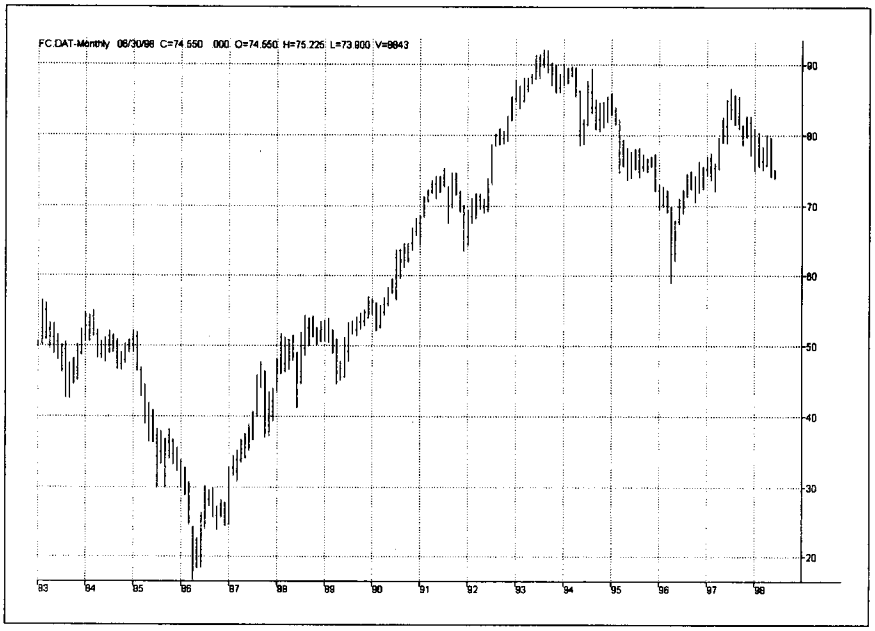


Futures Pricing

As discussed in other chapters, some futures contracts, such as those on metals, are priced very precisely on a cash-and-carry basis. Others, such as those on grains, are priced on a cash-and-carry basis within a crop year, but the price relationship changes across crop years. Contracts of either type are priced on a cash-and-carry basis because they can be stored and carried from one contract month to another and, thus, delivered and redelivered in more than one contract month. Cattle, however, as indicated above, are "perishable"; that is, they must be slaughtered within a short period of time after they have reached the stage where they are ready for slaughter, and they cannot be carried from one contract month to another. For this reason, cattle and feeder cattle futures contracts are not traded on a cash-and-carry basis. The futures prices of different months are related only by expected changes in the supply-demand relationship over time. This noncarry type of pricing is often called "expectational."

FIGURE 18-5

Feeder cattle futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



Futures Contracts

There are three active futures contracts based on the cattle complex. The major contract is the live cattle futures contract at the Chicago Mercantile Exchange (CME). The MidAmerica Commodity Exchange also trades a live cattle futures contract; it is one-half the size of the CME contract but identical in every other respect. The CME also trades a futures contract based on feeder cattle.

The advent of the live cattle futures contract was an important event in the history of the futures industry. The announcement by the CME in 1964 that it was about to begin trading in live cattle was regarded as revolutionary. Over a period exceeding 100 years, futures trading had been considered necessarily confined to inanimate products which had certain rigid characteristics. Products traded on a futures market, it was believed, had to have grade standards that were more precise and more generally accepted than those for cattle in order to be delivered and successfully accepted against futures contracts. Interchangeability of contract units seemed to require something more homogeneous than live steers, which vary so much in weight and quality. Trading was also confined to products that could be stored over long periods of time, which obviously was not possible for live steers. Even beef is not extensively stored because the limited storage facilities are expensive and consumers do not like frozen beef. Most important, it was thought that a successful futures market must be supported by the trade or those engaged in the production or processing of the product. New markets that had not received the support of the trade had failed to survive. Much of the nation's packing industry not only did not encourage the formation of a futures market for live beef cattle but also actively opposed it. In addition, the board of directors of the American Meat Institute, which represented the majority of U.S. meat packers, voted unanimously in opposition to the establishment of a futures market for live beef cattle. These groups may have had some concern that futures trading might become a vehicle for expanding governmental controls over the livestock and meat industry. The Chicago Mercantile Exchange, however, was not dissuaded, especially after the success of its pork bellies futures market had started in 1961. Trading in live beef cattle began in November 1964. Enough interest was expressed almost from the beginning by speculators, cattle raisers, and even some packers to make the new contract a success from the start. This contract marked an important event in the evolution of futures trading.

The trading unit for the CME live cattle contract is 40,000 pounds of USDA estimated yield grade 1, 2, 3, or 4 of choice-quality live steers averaging between 1050 and 1200 pounds, with no individual steer weighing in excess of 100 pounds above or below the average weight for the delivery unit. In addition, no individual steer weighing less than 950 pounds or more than 1300 pounds is deliverable. There are also several other delivery specifications involving hot yield, weight deviations, health, merchantability, and breeding. Some of these criteria are subjective—USDA graders inspect the cattle and determine their deliverability with respect to these subjective criteria.

The delivery months of the live cattle futures contract are February, April, June, August, October, and December. Par delivery points are Peoria, Illinois; Joliet, Illinois; Omaha, Nebraska; Sioux City, Iowa; and Greeley, Colorado. The minimum price fluctuation is 0.025 cent per pound or $10 per contract.

The par delivery unit of the CME feeder cattle contract is 44,000 pounds of feeder steers averaging between 575 and 700 pounds. No individual animal may weigh in excess of 50 pounds more or less than the average weight of the unit. There are several other delivery specifications, including muscle thickness, health, and merchantability. USDA graders make all decisions regarding deliverability and discounts from par, if any.

The delivery months of the feeder cattle contract are January, March, April, May, August, October, and November. Par delivery points are Omaha, Nebraska; Oklahoma City, Oklahoma; and Sioux City, Iowa. Delivery can also be made at several other points at varying discounts. The minimum price fluctuation is 0.025 cent per pound or $11 per contract.

Futures Contracts

The current futures contracts based on the livestock complex are shown in Exhibit 18-1.

Hedge Uses

Live cattle and feeder cattle futures are popular hedging vehicles for ranchers, beef packers, and other participants in the beef industry. The recent introduction of two new contracts, 90 percent lean boneless beef and 50 percent lean boneless beef trimming, expand hedging opportunities to grinders and processors.

According to the American Meat Institute, about one-third of all beef is sold in ground form: 50 percent lean boneless beef represents that amount that comes from the outside rim of fat and meat from steaks, roasts and ribs, which comes from cattle put in feedlots; 90 percent lean trimmings come mostly from beef cows retained on pasture to produce calves or from dairy cows. These two—"50s" and "90s," as they are known—are blended to produce the 73 percent to 82 percent lean ground beef used by the fast food industry and the 80 to 85 percent lean beef that is sold in grocery stores. The advent of these contracts makes it much easier for end users such as fast food chains to hedge their usage of ground beef and allows traditional hedgers to implement more sophisticated strategies. For instance, a long 90s/short 50s spread position could be used to hedge against the possibility of a shortage in dairy cows headed for slaughter versus fed cattle. Historically, dairy cattle slaughter has accounted for as much as 50 percent of the total beef production.

The price history of 50s and 90s are shown as Exhibits 18-2 and 18-3.

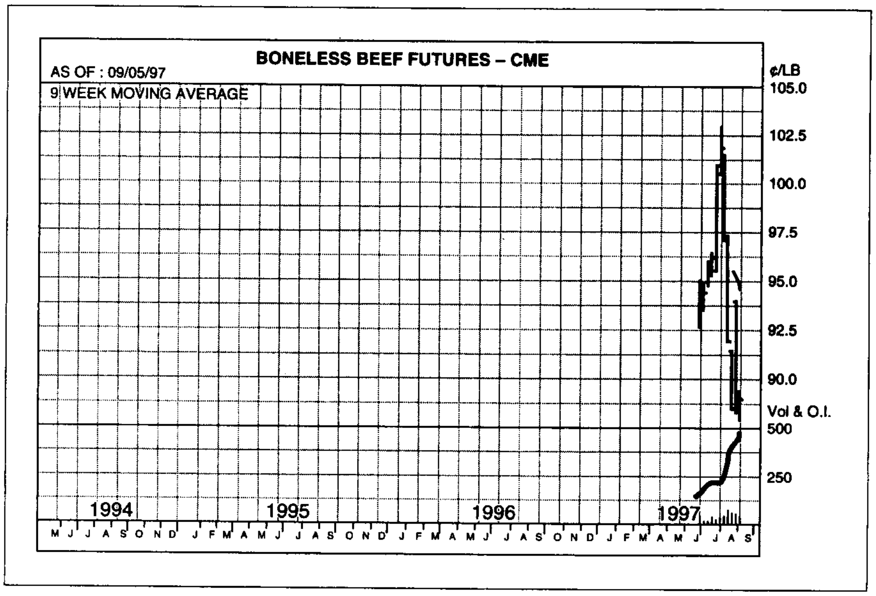
EXHIBIT 18-1

Livestock futures markets

Commodity	Contract Size	Price Quoted In	Minimum Fluctuation	Trading Hours (Local)	Options Available?
Chicago Mercantile Exchange					
CME					
Feeder Cattle	50,000 lbs.	cents/lb.	.025 cents/lb. = $12.50	9:05–1:00	Yes
Live Cattle	40,000 lbs.	cents/lb.	.025 cents/lb. = $10	9:05–1:00	Yes
Lean Hogs	40,000 lbs.	cents/lb.	.025 cents/lb. = $10	9:10–1:00	Yes
Pork Bellies	40,000 lbs.	cents/lb.	.025 cents/lb. = $10	9:10–1:00	Yes
Boneless Beef	20,000 lbs.	cents/lb.	.01 cents/lb. = $20	9:10–1:00	Yes
Boneless Beef Trimmings	20,000 lbs.	cents/lb.	.01 cents/lb. = $20	9:10–1:00	Yes
MidAmerica Commodity Exchange					
MIDAM					
Live Cattle	20,000 lbs.	cents/lb.	.025 cents/lb. = $5	9:05–1:15	No
Lean Hogs	20,000 lbs.	cents/lb.	.025 cents/lb. = $5	9:10–1:15	No

EXHIBIT 18–2

Boneless beef futures.



Source: Chicago Mercantile Exchange.

Speculative Uses

While the live and feeder cattle futures contracts have been used extensively by hedgers, they have also been popular speculative vehicles. They are bought and sold on the basis of the price determinants discussed above. Speculation prior to important USDA announcements is particularly common.

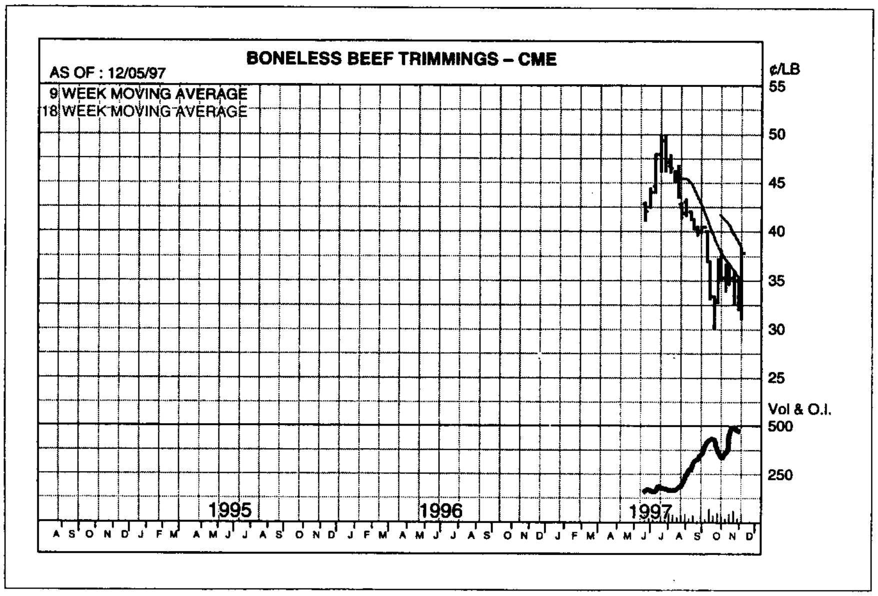
Intercontract spreads between the live and feeder cattle contracts on the basis of changes in the phase of the cattle cycle or even temporary price discrepancies and between either cattle contract and the corn contract are practiced. Spreads between the live cattle contract and the live hog contract are also common. Finally, because the cattle contracts are not priced on a carry basis, intracontract spreads in both are volatile and attract speculators for this reason.

Sources of Information

There are several important sources of information on the cattle futures contracts, issued by the government, trade associations, and private agen-

EXHIBIT 18-3

Boneless beef trimmings.



Source: Chicago Mercantile Exchange.

cies. Among the important USDA publications (from various USDA divisions) are:

1. *Livestock & Meat Outlook & Situation* (six times a year)—provides historical data summaries and analysis
2. *Cattle* (published in February and July)—shows cattle inventories on January 1 and July 1
3. *Livestock Slaughter* (monthly)—gives meat production and slaughter by weight and number for previous month
4. *Cattle on Feed* (monthly)—provides placements and marketings of cattle and calves on feed
5. *Livestock, Meat & Wool Market News* (weekly)—provides information on livestock receipts and slaughter
6. *Feed Situation* (quarterly)—reviews feed grain industries

Other USDA publications on cattle and beef are also available.

The *Yellow Sheets* provided by the National Provisioner on a daily basis give daily information on the cattle and beef markets. The daily pink *Meat Sheets* published by Meat Sheet, Inc., provide similar information.

The Chicago Mercantile Exchange provides an excellent report on livestock and meat fundamentals and summaries of their contract specifications. The Chicago Mercantile Exchange *Year Book* is also a valuable source of statistics on the cattle and cattle futures markets.

Notes from a Trader

In most years the cattle futures market is a good trading vehicle. Except for unusually surprising reports, the market is one of the less volatile. The length of time required for significant changes in the cattle cycle causes long trends in the futures market. There may be long periods of narrow ranges which might try the patience of more aggressive traders.

The analysis of this market may prove easier than that of some others because of the dominance of the supply side and the relative availability of figures. Some data, however, such as cattle-on-feed figures, may prove inaccurate at times. There is also less reliance on government support programs than in the case of many other commodities.

Intercontract spreads between live cattle and feeder cattle, based on changes in the phase of the cattle cycle, and between live cattle and corn, based on shorter-run profitability considerations, are also practiced. Speculators also transact intercontract spreads between live cattle and hogs on the basis of differences in their production cycles or differences in their demands. Intracontract spreads in the live-cattle market may also prove attractive because there is no normal carrying-charge relationship.

THE PORK COMPLEX

The hog is one of man's most valuable sources of food and other useful products. Probably its appeal as a livestock animal, even from earliest times, is that it is a dedicated scavenger and will eat a wide variety of foods. They are also extremely efficient converters of food and grow quite fast. A hog can easily gain 300 pounds in its first year of life. The typical animal marketed to slaughter is 5 to 7 months old and weighs 200 to 250 pounds.[6]

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[6] Kinney, Sweeten, Cross, Smith, Savell and Smith, "Lean Beef: Impetus for Lipid Modification," *Journal of the American Dietetics Association* (January 1990).

Hog raising became a significant U.S. industry during the 1800s, coinciding with large-scale corn, small grain, and leguminous grass production. The aim of early breeders was to produce large, fat animals. Lard was popular as a cooking fat, for soap-making, and as a lubricant. Because modern tastes demand leaner meat and lard has been replaced by vegetable and petroleum-based oils, hog breeding has adjusted by producing animals with less fat. This was recognized in 1996, when the Chicago Mercantile Exchange changed contract specifications to a leaner hog.

Traditionally, hogs have been raised on small to medium-sized farms as a mean of providing a stable cash flow to farm families while using a limited amount of resources. In recent year, however, large corporate hog farms have begun to dominate the pork industry. The 30 largest pork producers account for more than 25 percent of all animals marketed (see Table 18-4). The reason is the continued emphasis on vertical integration—companies that both raise hogs and process them into products sold in grocery stores. The rise in vertical integration is thought to originate from the increased consumer demand for higher-quality, leaner-pork products. This is a marked change from the cattle industry, where the majority of animals come from small operations.

Domestic hog production is dominated by Iowa and North Carolina. Minnesota, Nebraska, and Montana are also large producers. Table 18-5 shows hog production by state.

Supply

The definition of some terms is necessary, as with cattle, for understanding the production of hogs and pork:

Farrowing. The act of giving birth.

Gilts. Female swine that have not given birth to a litter.

Boars. Male hogs used for breeding.

Stags. Boars castrated after sexual maturity.

Barrows. Male hogs castrated before maturity (equivalent to steers in cattle production)—barrows gain weight more rapidly than boars.

The hog cycle is considerably shorter than the cattle cycle for physiological reasons. The gestation period for hogs is approximately 4 months or somewhat less (some say 3 months, 3 weeks, and 3 days); that is, farrowing occurs approximately 4 months after breeding. Since it takes

TABLE 18–4

30 Largest Pork Producers in the United States

Rank*	Name of Operation	Headquarters	Production Base	Main Business	Sows Owned
1	Murphy Family Farms	Rose Hill, NC	NC, MO, IA	Pork	180,000
2	Carroll's Foods	Warsaw, NC	NC, VA, SC	Turkeys, Pork	110,000
3	Premium Standard Farms	Princeton, MO	MO, TX	Pork	96,800
4	Tyson Foods	Springdale, AR	AR, NC, MO, OK, AL	Broilers, Pork	95,000
5	Cargill	Minneapolis, MN	NC, AR, MO, IL	Agricultural Commodities	77,000
6	Prestage Farms	Clinton, NC	NC, MS	Turkeys, Pork	74,000
7	Smithfield Foods	Smithfield, VA	NC, VA	Meat Packing	65,000
8	DeKalb Swine Breeders	DeKalb, IL	KS, OK, IL, TX, IA, CO	Swine Seedstock	64,973
9	National Farms	Kansas City, MO	NE, CO	Beef, Pork	34,000
10	Goldsboro Hog Farm	Goldsboro, NC	NC	Pork	30,000
11	Sand Systems	Columbus, NE	NE	Swine management	27,150
12	Continental Grain Company	New York, NY	NC, AR, IA, MO	Grain Merchandising	20,000
13	Louis Dreyfus Corporation	Pekin, IL	IL	Grain Merchandising	20,000
14	Seaboard Corporation	Shawnee Mission, KS	CO, OK	Poultry, Transportation, Pork	20,000
15	Hastings Pork	Hastings, NE	NE	Pork	18,000
16	Clougherty Packing Company	Los Angeles, CA	AZ, CA	Meat Packing	17,600
17	Gold Kist	Atlanta, GA	NC, GA, AL	Broilers, Pork, Farm Stores	16,500
18	Farmland Industries	Kansas City, MO	KS, MO, IA, MN, OK	Fertilizer, Feed, Meat Packing	16,000
19	Neuhoff Farms	Roanoke, VA	NC, VA	Pork	14,000

TABLE 18–4 *(Continued)*

20	Swine Graphics Enterprises	Webster City, IA	IA	Pork, Swine records	13,500
21	Pig Improvement Company	Franklin, KY	KY, WI, OK	Swine seedstock	13,000
22	D & D Farms	Pierre, SD	CO, SD	Pork, Crops	12,000
23	White Oak Mills	Elizabethtown, PA	PA, MD, DE	Feed Milling	12,000
24	Iowa Select Farms	Iowa Falls, IA	IA	Pork	11,400
25	N.G Punris Farms	Robbins, NC	NC, SC	Pork, Turkeys	11,200
26	Christensen Farms & Feedlots	Sleepy Eye, MN	MN	Pork, Construction	11,000
27	J.C Howard Farms	Deep Run, NC	NC	Pork, Crops, Agribusiness	10,800
28	J&K Farms	Harrells, NC	NC	Pork	10,400
29	Agrivest	Waynetown, IN	IN	Stocks, Swine management	10,000
29	Coharie Mill & Supply Company	Clinton, NC	NC	Feed Milling	10,000
29	Land O Lakes	Minneapolis, MN	IA	Agronomy, Feed, Seed, Food	10,000

*Ranked by sows owned in full production on October 1, 1994.

Source: National Pork Producers Council.

TABLE 18-5

Top Ten Pork-Producing States

State	Number of Head (thousands)
Iowa	22,223
North Carolina	13,295
Minnesota	9,201
Illinois	8,300
Indiana	6,906
Nebraska	6,397
Missouri	5,934
Ohio	3,238
South Dakota	2,260
Kansas	2,404

Source: National Pork Producers Council.

approximately 1 month to breed a sow, each sow is bred approximately twice a year.

Litters range from 5 to 15 pigs, with a recent average of slightly less than 9. The pigs are weaned, that is, taken away from their nursing mothers, 6 weeks after birth. Between farrowing and weaning, an average of slightly less than two pigs are lost, more during severe winters, so an average of about seven pigs survive weaning. The litter size reported by the USDA refers to pigs surviving weaning. Although the sows can produce two litters each year for several years, they become heavier the more litters they produce and, as a result, sell at a discount. Sows are, thus, typically slaughtered after producing only one or two litters.

Gilts reach both sexual maturity and slaughter weight at about 6 months of age. So, at 6 months of age, gilts can be either withheld from slaughter and added to the supply of breeding sows or slaughtered. Barrows are also fed to approximately 6 months of age before slaughter. Figure 18-6 summarizes the hog production cycle.

On the basis of the hog production cycle, the hog cycle is considered to be about 4 years, versus about 12 years for the cattle cycle, although hog cycles may range from 3 to 6 years. During the last 50 years, there have been 12 hog cycles averaging 4.1 years and comprising expansions of approximately 2.4 years and contractions of approximately 1.7 years.

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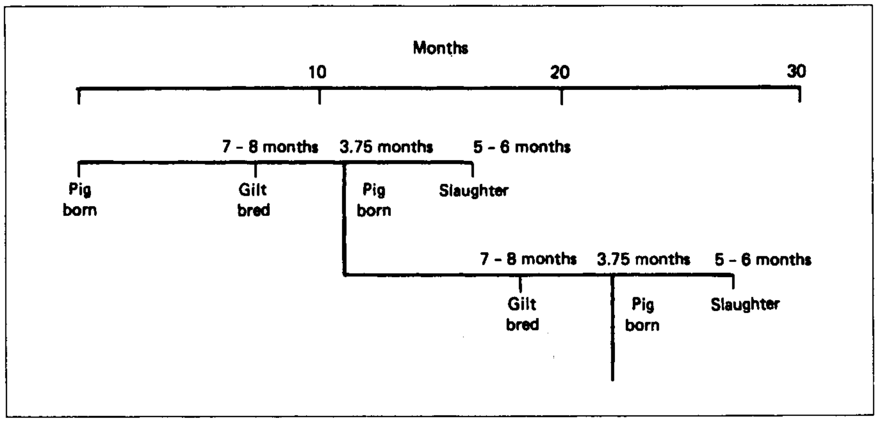
FIGURE 18-6

Pork production cycle. (U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, February 1979.)



During the feeding process, pigs are fed a combination of grain (mainly corn, but also oats or soybeans) and a commercial protein supplement, with additions of vitamins, minerals, and antibiotics. Recently, hogs have been slaughtered when they weigh about 220 pounds. When the price of feed is high relative to hog prices, hogs are usually slaughtered at lighter weights; at lower feed prices relative to hog prices, they are fed to heavier weights.

During recent years, hogs and pork have become much leaner. For example, between 1956 and 1980, pork production increased by 60 percent, while the number of hogs slaughtered increased by only 22 percent. And while the amount of pork produced per hog increased by more than 30 percent (to 170 pounds), only 4 percent of this was due to an increase in the average weight of hogs slaughtered (to 240 pounds). Another indication of the production of leaner hogs is that during this period the average lard production per hog declined from approximately 33 pounds to 13 pounds.

Feed costs represent a higher fraction of the total costs of hog production than in the case of cattle production. Whereas for hogs, feed costs represent approximately 38 percent of total costs and replacement animals 46 percent, for cattle, as indicated, the corresponding proportions are 31 percent and 56 percent. On the average, about 4.4 pounds of feed are needed for each pound of slaughter hog. The costs of corn and soybean meal are the dominant feed costs. It is for these reasons that the hog-corn ratio is an important indicator of profitability and future supply in the hog industry. The increased volatility of grain prices discussed in the previous chapter and the relatively long production period for slaughter hogs, thus, provide a difficult planning situation for hog producers.

When hogs are ready for slaughter, they can be sold directly to packers or through terminal markets or auctions. As with cattle, an increasing fraction has been marketed directly to packers—in 1980, over three-fourths of the total sales were to packers.

While there are obvious similarities between cattle and hog production, there are also important differences. One is that while cattle production usually involves two or three separate businesses (the cow-calf operation, the feeder, and, perhaps, the intermediate stocker cattle phase), hogs are typically produced in a single unit, often called a "farrow-to-finish" operation. That is, the pigs usually remain at the same location from farrowing to finish. There are several reasons for the stationary location in hog production. First, hogs cannot convert grass and grazing roughage into protein, and so there is no equivalent of a stocker operation. Second, sows, baby pigs, and hogs all eat essentially the same feed. Finally, young pigs are very sensitive to stress and disease, and as a result, feeder pigs cannot be effectively moved from one location to another. Relocation can slow weight gains and extend the feeding period. For these reasons, about 80 percent of all pigs spend their entire lives in the same farrow-to-finish operation.

Although hog production remains an important part of American agriculture, hog producers, like cattle producers, have become fewer in number and larger in size. For example, in 1981 less than 5 percent of the total hog operations in the United States accounted for over 45 percent of all hogs produced—these operations had in excess of 500 hogs. Consistent with this increased size, hog production has become very capital-intensive, using expensive buildings and equipment. The increased capital, in addition to decreasing costs, enhances the production of hogs during severe winters and hot summers in the corn belt.

In the past, all females were bred at the same times, once in the spring and once in the fall, and so a distinct seasonal in hog production was created. Hog marketings were, thus, very high during the winter and very low during the summer. Now hog production is much more uniform throughout the year. While marketings are still lowest in July, they have increased relatively during this time. Hog marketings have minor peaks in March through April and in October through November.

The Pipeline Approach As with the supply of beef, the supply of newly produced pork can be forecast by considering the production cycle. The first step in the pipeline approach for pork involves the number of farrowings, that is, the number of pigs born. The USDA, on a quarterly basis (the 22d of March, June, September, and December) in its *Hogs and Pigs* report, provides data on the number of pigs saved (surviving weaning) and the number of sow farrowings for the 10 largest hog-producing states (Georgia, Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Carolina, and Ohio), which produce over 75 percent of the total hogs in the United States. From the number of pigs saved and the number of sow farrowings the total national pig crop can be estimated. Since it takes approximately 6 months to bring a newborn pig to a slaughter weight of 200 to 240 pounds, the total number of hogs slaughtered 6 months later can be estimated. From the hog slaughter, the amount of pork production can also be forecast.

Variations Affecting the Pipeline Approach Each of the forecasts is based on estimates, and errors can enter at each step. First, the 10 major states do not always produce the same fraction of pigs in the United States. Second, and more important, the relation between pigs produced and hogs slaughtered 6 months later is variable. The period between birth and slaughter can vary due to weather and the price of feed relative to the price of pork—relatively high feed prices will result in earlier slaughters at lighter weights, and vice versa. Another factor that affects this relationship is the number of gilts withheld from slaughter in order to be added to the breeding herd. During the expansion phase of the hog cycle, gilts are withheld from slaughter, and the hog slaughter will be less relative to farrowings. During the contraction phase, sows are culled from the herd and gilts are not withheld from slaughter, and the number of hogs slaughtered increases relative to pig farrowings. The USDA provides weekly data on the female portion of total hog slaughter.

Demand

Pork has always played an important role in the U.S. diet, although the per capita consumption of pork has increased by much less than that of beef and chicken since 1940. Pork is consumed in several different forms. At the packing plant, the hog is slaughtered and cut into halves or quarters for shipment to a processor, or cut into smaller pieces called wholesale cuts.

According to estimates, a 220-pound hog will yield about 153 pounds of pork, trimmings, and lard with proportions as follows: fresh hams, 18.5 percent; pork bellies, 17.5 percent; loins, 15.0 percent; fat back, clear plate, and fat trimmings, 18.0 percent; picnics, 8.5 percent; and other, 22.5 percent. The six main commercial cuts of pork are hams and loins, the largest; picnics (a hamlike cut from the front leg of the hog); Boston butts; bellies; and spareribs.

These cuts account for over 40 percent of the weight and 90 percent of the value of hogs. Each cut has different characteristics. While loins and butts are sold fresh, most of the other cuts are processed. This represents another major difference between the cattle and hog industries—while most beef is used fresh soon after slaughter, a large portion of pork is processed and becomes storable. For example, hams and picnics can be smoked, canned, or frozen, and pork bellies can be stored for up to 1 year before processing. The storability of pork products means that forecasts of futures supplies must consider not only new production but also stocks, particularly for pork bellies.

The various cuts of pork also have different seasonals in demand. For example, the demand for ham is particularly large before Christmas and Easter, while the demand for pork bellies usually peaks during late summer.

Because there is a futures contract on one particular cut of hogs—pork bellies—we will consider this hog product in more detail. The pork belly is the layer of meat and fat from the underside of a hog. Each hog has two bellies, one on each side, which extend from the front to the rear legs. Each belly weighs between 10 and 20 pounds, depending on the size of the hog. Bellies are divided into five 2-pound weight ranges—10 to 12, 12 to 14, 14 to 16, 16 to 18, and 18 to 20 pounds—with most bellies in the middle ranges. Bellies typically account for about 12 percent of the total weight of hogs and about 17 percent of total pork production. Almost all bellies are cured, smoked, and sliced into bacon by either the firm that slaughters the hog or another firm. There is also a well-developed cash market for pork bellies between packers and processors, which is fostered by the demand for bellies for delivery on the pork belly futures contract.

While the amount of pork frozen and available for subsequent use is small overall—less than 2.5 percent of total pork production is frozen—approximately 7 to 10 percent of the bellies produced are frozen. The seasonal low of frozen stocks is in late summer through early fall, while the high is during the late spring. The period June–September represents the months of greatest movement of bellies out of freezers in response to the peak summer demand for bacon.

Price Determinants

Pork prices are determined by basic supply-demand factors. On the supply side, the phase of the hog cycle has an important effect on prices. Data on the size of the pig crop, hog slaughter, slaughter weights, and the fraction of females in slaughter, as discussed above, can be used in forecasting supplies.

The ratio of the price of corn, the major feed for hogs, to the price of hogs affects the profitability of raising hogs and the future supply. A low ratio of corn price to hog price indicates that feeding is profitable, which will, in the short run, lead to hogs being fed to heavier weights and in the longer run to breeding herds being expanded. These factors tend to contract supply in the very short run but expand supply in the longer run, with the opposite effect on prices.

During recent years, the price of corn has become a smaller fraction of the total costs of producing hogs as other feed supplements and protein meals have been used as feed and as fixed costs, due to buildings and equipment, have increased. Thus, while still useful, the hog-corn price ratio is somewhat less useful as an indicator of the profitability of producing hogs. The hog-corn price ratio is the price of hogs per hundred pounds divided by the price of corn per bushel. Data on the hog-corn ratio are closely watched in this regard. Figure 18-7 shows a plot of the hog-corn ratio in recent years.

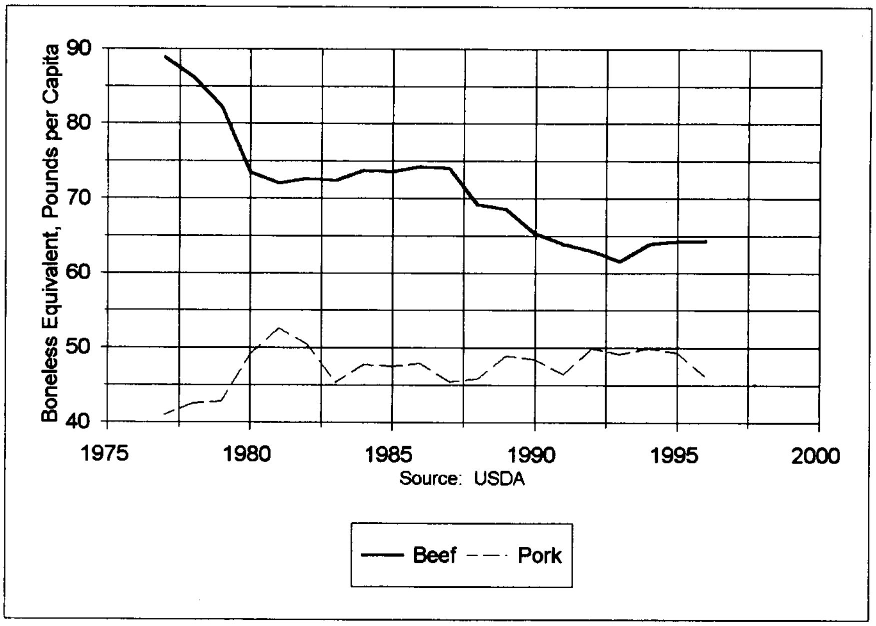
On the demand side, pork prices are affected in the long run by the size and age mix of the population and the consumer taste for pork relative to the taste for other products, such as beef. In the short run, the real income of consumers and the prices of these competing products affect the demand for pork. Prior to about 1950, the per capita consumption of pork was higher than that of either beef or chicken. Since then, however, the per capita consumption of pork has remained approximately constant, while that of beef and chicken has increased considerably. As a result, per capita pork consumption has recently been considerably below the per capita consumption of beef (Table 18-6).

Futures Contracts

There are futures contracts based on frozen pork bellies and lean hogs, both traded on the Chicago Mercantile Exchange. Pork belly futures trading began during September 1961, became active during 1964, and has experienced significant trading volume and open interest since 1965. The pork belly futures contract is based on 38,000 pounds of frozen pork bel-

TABLE 18–6

U.S. Beef and Pork Consumption, 1975–1996



Source: USDA

lies from one federally inspected packing plant that is also approved by the Chicago Mercantile Exchange. Each belly must be USDA-approved, cannot have more than 75 minor defects (a schedule of defects is provided by the exchange), and must be produced from a barrow, gilt, or sow—no bellies from stags and boars are permitted. Bellies in the 12- to 14-pound or 14- to 16-pound range are eligible for par delivery. Bellies that have more than 75 minor defects and that are in the 16- to 18-pound range are deliverable at discounts.

Deliveries are made in Chicago at par, although deliveries can also be made at other exchange-approved delivery points at allowances specified by the exchange. The delivery months are February, March, May, July, and August. Given the minimum level of pork bellies in storage during October, the February to August contracts in the same calendar year represent the same crop year. Prices are quoted in cents per pound, with a minimum price fluctuation of 0.025 cent per pound, or $9.50 per contract.

Futures trading in live hogs began during February 1966, and during recent years the trading volume has exceeded that of pork bellies. Each contract is based on 30,000 pounds of USDA Grade 1, 2, 3, or 4 barrows and gilts. The delivery unit must average between 200 and 230 pounds, with at least 90 hogs in each unit in the 200- to 230-pound range. Hogs in the 190- to 200-pound and 230- to 240-pound ranges are deliverable at a discount, while hogs below 190 pounds or above 240 pounds are not deliverable.

Prices are quoted in cents per pound, with a minimum price fluctuation of 0.025 cent per pound, or $7.50 per contract. The delivery months are February, April, June, July, August, October, and December. Since hogs are not storable, there is no crop year in the live hog futures contract. Par delivery can be made at Peoria, Illinois, although delivery can also be made at approved delivery points in other hog-producing states at 25-cent and 50-cent discounts per hundredweight.

Futures contracts based on feeder pigs have been considered but have not been attempted because, as indicated above, it is inefficient to transport feeder pigs, and most pigs remain on the same farrow-to-finish operation.

Speculative Uses

The live hog and particularly the pork belly futures contracts have been very popular speculative vehicles for speculators who wish to "buy 'em" or "sell 'em" on the basis of the pricing factors discussed above. The pork belly contract is one of the most volatile futures contracts, with many limit-up and limit-down days.

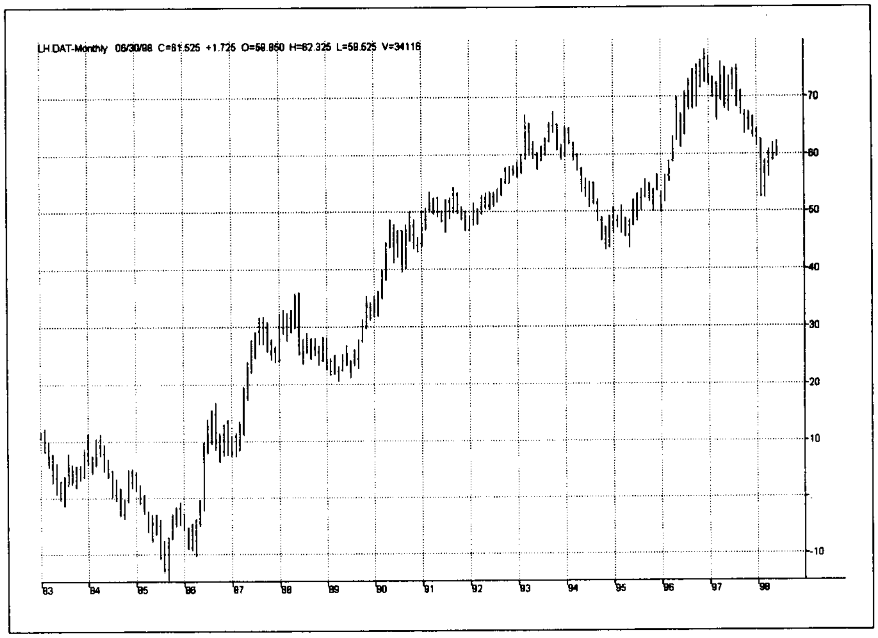
The recent prices of the lean hog and pork belly futures contracts are shown in Figures 18-7 and 18-8. This volatility relates primarily to variations in the level of hog production, variations in the levels of inventories, changes in the hog-corn price ratio, and, at times, speculative psychology.

Despite being very related, the futures prices of hogs and pork bellies are determined differently. Hogs are not storable, and so the prices of the various months of the live hog futures contract are not related by storage costs, and there is no crop year in hogs. The prices of the various months of the pork belly futures contract are related by carry, and pork bellies have a crop year. Thus, intracommodity spreads in the live hog contract are extremely variable, and considerable profits, or losses, can result.

Since pork bellies can be stored for several months, contracts within the same crop year, from February through August, represent bellies in the same crop year. Thus, "belly spreads" can be done within a crop year or across crop years. An August contract against a February contract of the

FIGURE 18–7

Lean hog futures, 1984–1997. Chart created using TradeStation by Omega Research, Inc.



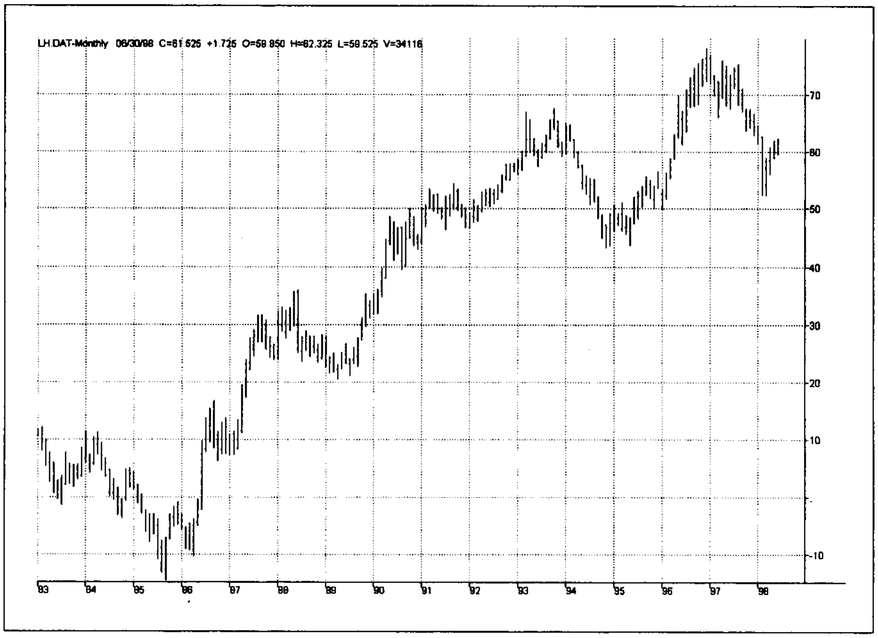
following year is a popular spread across crop years because bellies received on delivery on the August contract cannot be delivered against the February contract, and the spread is, therefore, extremely volatile. Other spreads across crop years are also very volatile, as they are in grains, while intra-crop-year spreads are less volatile.

The live hog and pork belly futures contracts are also used for intercommodity spreads. A popular intercommodity spread, hogs against bellies, is based on differences in the demands for these products and the frozen storage of bellies. Figure 18-9 provides a plot of their price ratio in recent years. As indicated, this spread has also been fairly volatile.

The lean hog-live cattle spread is also a common spread. It is based on differences in the seasonal and cyclical production levels of these two meat substitutes. Figure 18-10 shows the recent volatility of this spread. The hog-corn spread, discussed above, is a popular spread involving the hog contract.

FIGURE 18-7

Lean hog futures, 1984–1997. Chart created using TradeStation by Omega Research, Inc.



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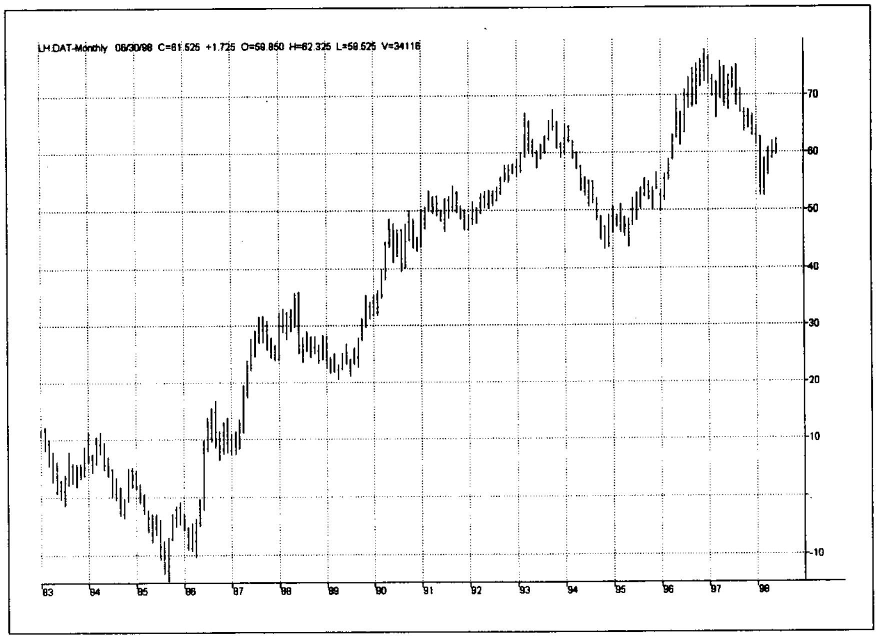

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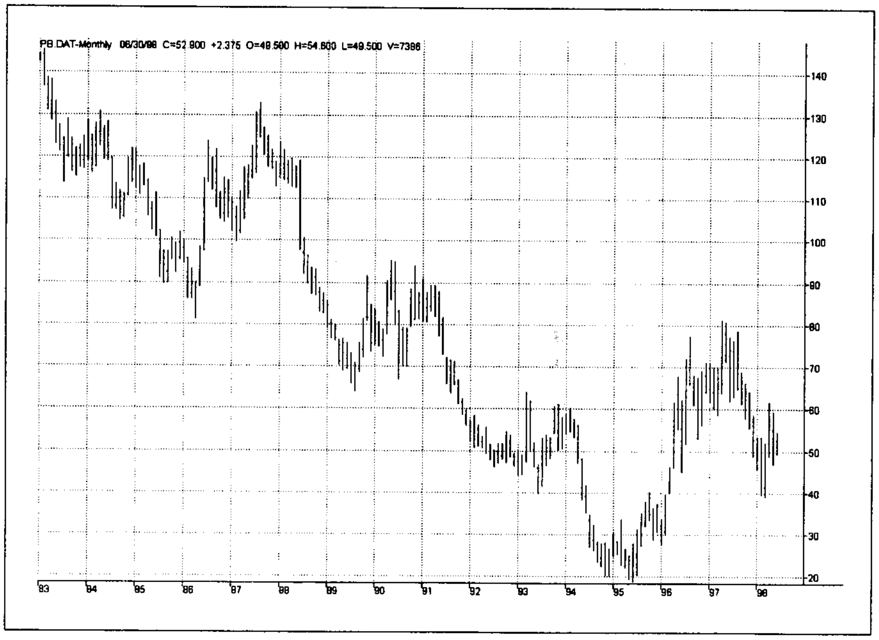
FIGURE 18-8

Pork belly futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



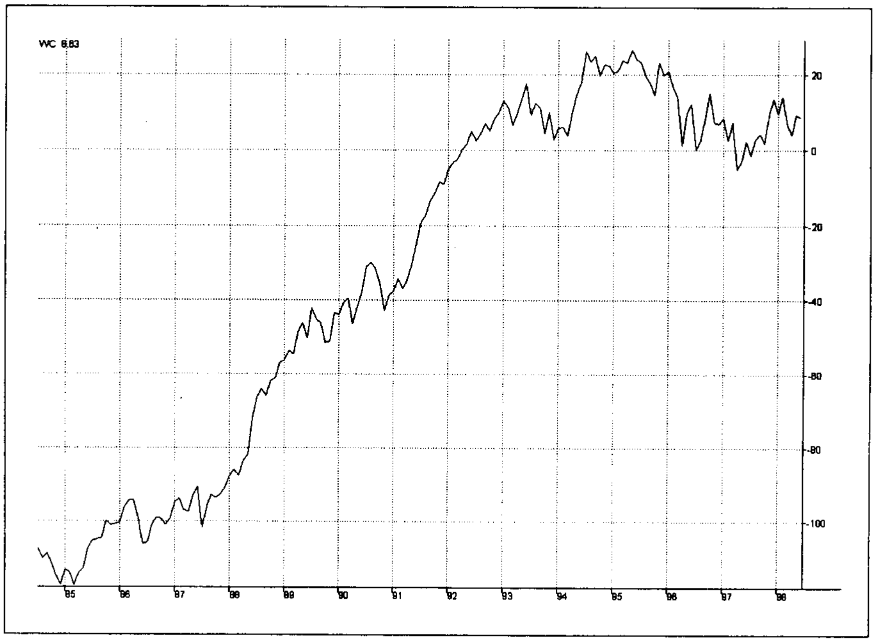
Sources of Information

The most important source of information is probably the *Hogs and Pigs* report, published quarterly by the Crop Reporting Board of the Statistical Reporting Service of the USDA on the 22d of March, June, September, and December. This report, based on a survey taken about 3 weeks earlier, covers all 50 states during December and June and the 10 major hog-producing states during March and September. The report provides data by state on the number of sow farrowings, the number of pigs saved per sow, and the total number saved. It also gives producers' intentions for sow farrowings during the next two quarters.

Cold Storage, from the same USDA division, is published each month (on or about the 20th) and provides freezer inventories of bellies, picnics, hams, loins, spareribs, trimmings, and total pork at the end of the preceding month. It also provides data on freezer inventories of beef, poultry, and many other commodities.

FIGURE 18–9

Lean hog/pork belly spread. Chart created using TradeStation by Omega Research, Inc.

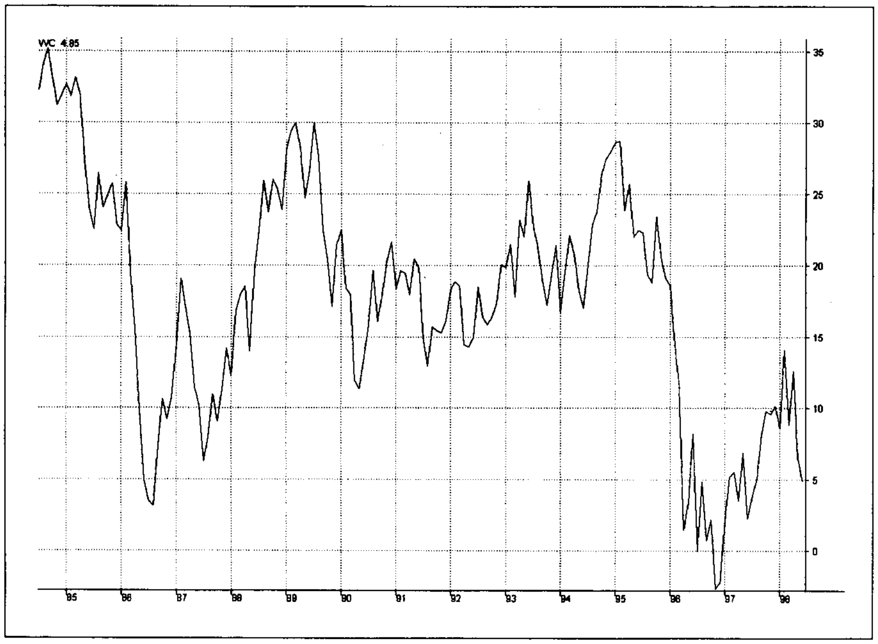


The *Livestock Slaughter* report, also published monthly (on or about the 20th) by the USDA, provides data on hog slaughters. *Livestock and Meat Statistics,* an annual published by the USDA, provides more detailed data on a historical basis. The weekly *Livestock, Meat & Wool Market News,* also published by the USDA, provides extensive data on hogs and pork. The *Livestock & Meat Outlook & Situation* is published by the USDA six times a year and provides historical information on the livestock and meat markets. *Feed Situation,* a quarterly published by the USDA, provides data on the feed industries. Two sources of information on daily prices provided by private sources are also closely watched: the *Yellow Sheet* and the pink *Meat Sheet.*

The Chicago Mercantile Exchange *Year Book* contains daily prices, volume, and open interest for each contract, daily cash prices, and useful statistical information related to the supply of and demand for hogs, pork, and pork bellies.

FIGURE 18–10

Live cattle/lean hog spread. Chart created using TradeStation 4.0 by Omega Research, Inc.



Notes from a Trader

Pork bellies provide a favorite vehicle for day traders because the typical day's price range can easily cover the reduced commission granted for day trades and provide a reasonable profit. Because of the volatility of the market and the popularity of day trading in the market, the last minutes of trading are often particularly volatile, and execution prices are often disappointing.

The belly market lends itself well to spreads such as the February–July or February–August spread. Nearby contracts usually gain enough on the distant in bull markets and lose enough in bear markets to make these spreads attractive, especially considering the lower margin and reduction in risk.

The response of the market opening to the news of the day may be out of proportion to its significance, particularly in the case of the morning hog run, storage movement, or hog prices. Also, the market tends to anticipate important reports, such as those on the pig-crop or cold-storage supply, more accurately than other markets, such as grains.

Because the market is so much better oriented to changes in supply than to changes in demand, it is easier for traders to determine meaningful relationships than in more two-sided markets. If one is stubborn and willing to fight markets, it is advisable to choose markets other than pork bellies or hogs.

19 CHAPTER

Precious and Industrial Metals

"To increase the value of gold, have it handled by a dentist."

This chapter covers futures contracts based on precious and industrial metals. Precious metals are traded on three U.S. exchanges—the New York Commodity Exchange (COMEX), the Chicago Board of Trade, and the Mid-American Exchange. Industrial metals (also referred to as *base metals*) are traded at the London Metal Exchange.

PRECIOUS METALS

Futures contracts are currently available on gold, silver, platinum, and palladium.

Gold

Introduction Gold has excellent industrial properties, including electrical conductivity, malleability, and durability and indestructibility. While gold is used to some extent in electronic applications, it has two other properties that increase its value and, for this reason, limit its industrial use.

First, gold is lustrous and does not lose its luster. This quality and its malleability, which permits it to be pounded into very thin sheets, make it very desirable for jewelry.

Due to its domestic and international monetary roles and its use for storing (or often hoarding) value and also to its use for jewelry, and for other unexplained reasons, gold has always had value in excess of its value for industrial use. These uses limit the industrial use of gold and make it a precious metal rather than an industrial metal.

While gold has had value for international exchange for centuries, the "modern era" of gold for this purpose began in 1944 with the Bretton Woods Agreement. This agreement set several important international monetary policies. Among them was the provision for the conversion of gold into U.S. dollars, by the U.S. government, at $35 per ounce. Interestingly, this was done more to stabilize the price of the dollar than to stabilize the price of gold.

Gradually, however, the dollar weakened against gold. In 1965 and 1968, the gold reserve requirements for U.S. member bank reserves and U.S. Federal Reserve notes, respectively, were removed. These changes made possible the beginning of a free market for gold, primarily in Zurich. The weakening of the dollar continued when, on August 15, 1971, the Smithsonian Agreement terminated the $35-per-ounce price of gold (and with this the fixed exchange rate between the dollar and other foreign currencies). Gold prices were allowed to float and be determined by the free international market for gold.

Finally, during 1974 the U.S. government announced that U.S. citizens could hold gold legally beginning on December 31, 1974. Prior to this, many U.S. citizens held gold illegally overseas. In response to this change in policy, on December 31, 1974, gold futures contracts began to be traded on several exchanges. This began the period of extreme volatility in gold prices. The pinnacle of gold prices was achieved during January 1980, when the price of gold rose to $850 per ounce. At the beginning of 1985, it was below $300 per ounce.

However, since the rise of gold in the early 1980s, gold has lost much of its attraction as a store of value. Because gold is a physical commodity, it must be stored, and large investors in the metal must pay the cost for that storage. In contrast, intangible assets such as stocks (and bonds) pay dividends (interest), which can be regarded as a negative storage cost (i.e., the investor receives income from holding the investment). Low inflation is another reason gold has lost much of its allure. However, gold has still retained its importance as an industrial metal, especially in the computer industry.

Supply The two major producers of gold are South Africa and the former Soviet Union (FSU). South Africa is the largest gold producer, responsible for about 34 percent of the world's total. The bulk of the refined gold produced at these mines is sold by the South African Reserve Bank in 400-ounce bars at the price ruling on the London bullion market. Major buyers of the metal are dealers, banks, institutions, large private buyers, and industrial resellers.

The former Soviet Union is the second largest producer of the yellow metal. The FSU produces approximately 20 percent of the world's reserves. Canada and the United States are the third and fourth largest producers, respectively. In the United States, gold is produced mainly as a by-product of other mining activities. Table 19-1 provides additional statistics on the world production of gold.

The fineness of gold is measured in karats: 24-karat gold is pure gold, so each karat is $\frac{1}{24}$th part of pure gold in an alloy.

Since gold has been held by private individuals, international agencies, and national governments, gold supplies come not only from new production but also from dishoarding by these groups. The United States and the International Monetary Fund (IMF) have been major dishoarders via gold auctions.

Exhibit 19-1 shows the demand for gold in key markets.

Demand Over 50 percent of the use of gold satisfies a combination of demand for jewelry and industrial purposes. The largest industrial uses are for electronics, space and defense, and dentistry. The majority of the other uses of gold are for gold coins, much of which is for hoarding, and other forms of hoarding gold.

Price Determinants The price of gold is determined more by its role as an international medium of exchange and store of value than by its industrial use.

Due to the pivotal role of the U.S. dollar in the international financial system, when the dollar is strong against other foreign currencies, it is also usually strong against gold (and the price of gold is low), and vice versa. Thus, the factors discussed in Chapter 21 that tend to make the dollar

TABLE 19-1

Gold World Production and Demand,* metric tons

	Mine Production	Gold Demand
1984	1,382	1,529
1985	1,446	1,571
1986	1,698	1,786
1987	1,686	1,688
1988	1,814	1,942
1989	1,948	2,340
1990	2,145	2,478
1991	2,020	2,590
1992	1,947	2,891
1993	2,089	2,763
1994	2,069	2,700
1995	1,992	3,007
1996 (est.)	2,064	3,183

*CIS production not included.

Source: South Africa Chamber of Mines Statistical Data.

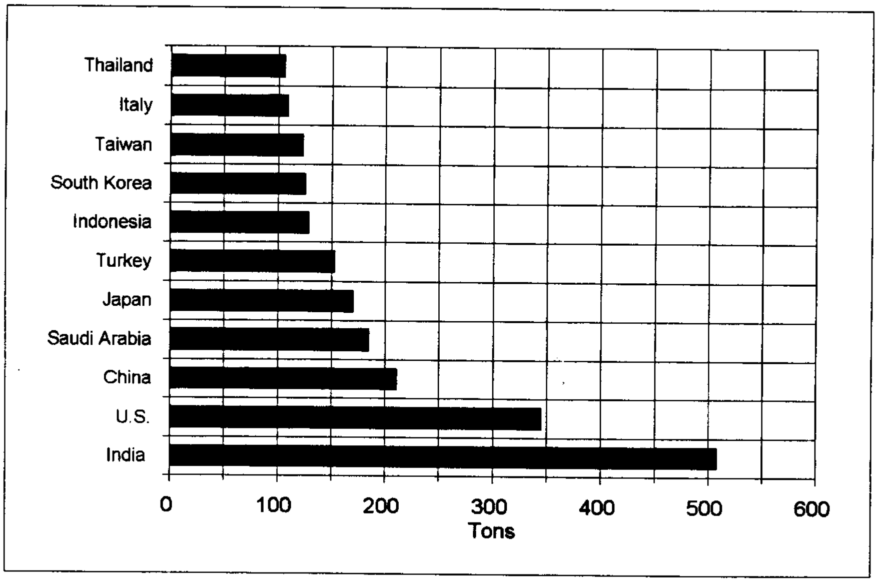
strong against foreign currencies also tend to make the dollar strong against gold and the dollar price of gold low. Among these factors are high U.S. interest rates, low U.S. inflation, and a U.S. balance of payments surplus. Since the United States is a major importer of crude oil, decreasing oil prices also usually strengthen the dollar against many other foreign currencies and against gold.

Political factors also affect the price of gold, sometimes at the expense of the strength of the dollar. Wars and political unrest in other parts of the world often strengthen gold against the dollar, even though the dollar may become stronger against other foreign currencies.

Changes in the balance between supply and demand also affect the price of gold. Increased sales by the producing countries, such as South Africa and the Soviet Union, or by international agencies or governments, such as the IMF or the United States, tend to decrease the price of gold. The increased industrial demand for gold or a decline in industrial gold stocks also tend to decrease the price of gold.

EXHIBIT 19–1

Demand for gold in key markets, 1996.



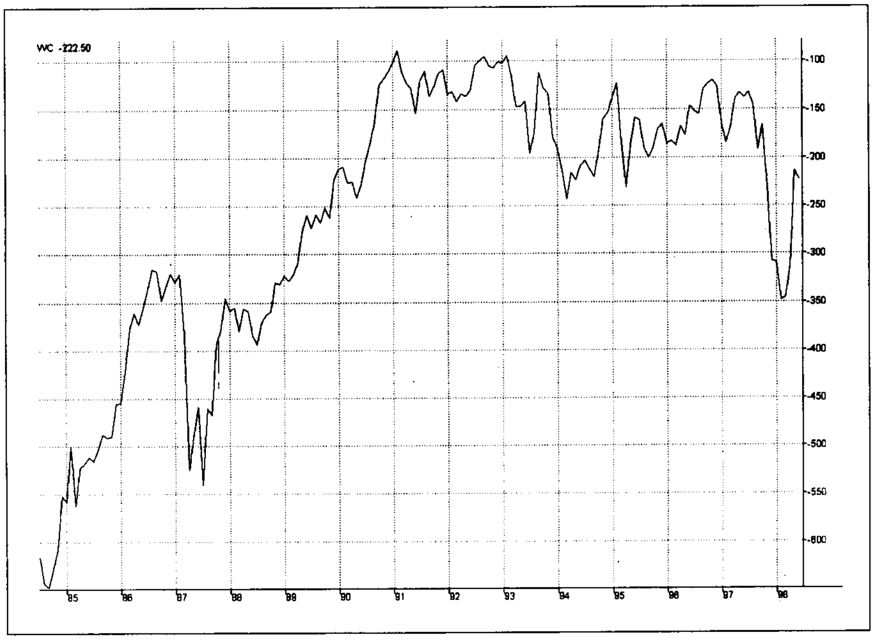
Source: World Gold Council.

Finally, the price of gold relative to the price of the other major precious metal, silver, also tends to affect the price of gold. The gold-silver price ratio is a closely watched indicator of both the price of gold and the price of silver. The use of this indicator may seem unusual in view of the ratio's variability, as shown in Figure 19-1. This ratio is closely watched regardless of the fundamental factors affecting gold and silver prices independently.

Futures Contracts Gold futures trading began on December 31, 1974, on several exchanges, including Comex, the Chicago Board of Trade, the International Monetary Market (of the Chicago Mercantile Exchange), and the MidAmerica Exchange. The trading volume on these contracts has continued to grow, and the Comex gold futures contract is now the third largest futures contract in terms of trading volume and open interest. Cur rently three gold futures contracts are traded actively, the major one being at Comex (100 troy ounces), with smaller-size futures contracts at the CBT

FIGURE 19-1

Gold futures (nearby)/silver futures (nearby).



(1 kilogram) and the MidAmerica Exchange (33.2 troy ounces). Except for their size, these contracts are essentially the same. More detailed specifications of these contracts are provided in Chapter 3.

Speculative Uses Gold producers, fabricators, traders, and distributors use gold futures contracts to hedge their inventories. In addition, gold spreads can be used to hedge short-term interest rates. For example, a short nearby gold-long deferred gold futures spread locks in a 3-month borrowing cost.

But gold futures contracts are premier speculative vehicles. While there are many other ways to speculate in gold, such as with gold coins and gold bullion, gold futures contracts, due to their high leverage, low transaction costs, and the reputability of the markets, are the most popular vehicles for speculating in gold. Most gold futures contract speculation is standard "buy-'em" and "sell-'em" speculation based on the factors discussed above and other factors.

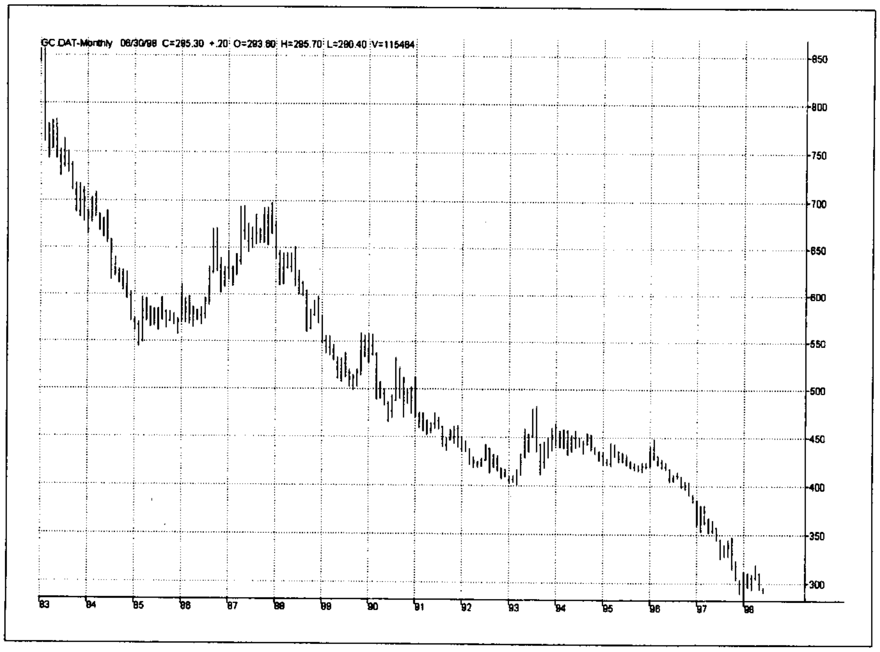
There are two other important factors in the gold markets in addition to the fundamental factors. They are technical and emotional. Technical factors play an important role in the gold futures markets.

And, as in any other speculative market, emotions play an important role in pricing. It is for this reason that gold prices could go from \$35 per ounce in 1971 to \$850 in 1980 to below \$300 in 1982 and early 1985, with few fundamental changes in the market for industrial gold over this period. Figure 19-2 provides a plot of recent gold futures prices.

Because gold has been an important speculative vehicle for centuries, for both individuals and institutions, gold is likely to remain the world's premier speculative commodity. Gold futures markets have begun in several foreign countries (Tokyo; Hong Kong; London; Sydney, Australia; Singapore; and Winnipeg, Canada), and several other foreign countries are planning gold futures markets.

FIGURE 19–2

Gold futures, 1983–1997.



And options on the gold futures contract which began to be traded at Comex during October 1982 have become very liquid and provide a new dimension for gold speculation. The risk-reward combinations of gold options for speculators are discussed in Chapter 9.

Silver

Introduction Silver was one of the first metals discovered by humans and has been a storehouse of value for thousands of years. In ancient times, silver was used for jewelry, ornaments, utensils, and as barter for goods and services. The metal also served as the basis for the Roman monetary system, as some of the earliest coinage was minted from silver. The discovery during the eighteenth and nineteenth centuries of large caches of silver in the New World, however, resulted in the conversion of most monetary systems to the gold standard.

Currently, the value of silver is determined mainly by its technical and industrial properties—high electrical and thermal conductivity, malleability, ductility, and resistance to corrosion—all of which have made it useful in photography, electronics, and computing applications.

Supply The supply of silver comes from both primary sources—mine production—and secondary sources—scrap production and dishoarding. Over 70 percent of the mine production of silver comes not from silver mines but as a by-product of the mining of other metals, such as nickel, copper, lead, zinc, and gold.

Most newly mined silver comes from Mexico, Peru, Canada, the United States, and Australia (among the noncommunist countries), as shown in Table 19-2. Russia is also a major producer. Recently, most of the increase in silver production has come from Mexico and Chile.

The supply of newly mined silver has been relatively insensitive to the price of silver, since it is mainly a by-product of the production of other metals.

Demand The United States is the largest user of silver in the world, followed by Japan and India, as shown in Table 19-3.

Approximately one-half of the U.S. use of silver is for photography. Silver is critical for photography because it is the only material which magnifies light (or the photons of light) approximately a billion times. The sec-

TABLE 19–2

World Mine Production of Silver, by Selected Countries, thousands of kilograms (metric tons)

Year	Australia	Bolivia	Brazil	Canada[*]	Chile	China	Japan	Kazakhstan[†]	Rep. of Korea	Mexico	Peru	Poland	South Africa	Spain	Sweden	United States	World Total[‡]
1981	743	199	24	1,129	361	78	280	1,446	95	1,646	1,460	640	235	166	161	1,265	11,246
1982	907	170	24	1,314	382	78	306	1,459	101	1,840	1,305	657	216	118	168	1,252	11,543
1983	1,033	187	15	1,106	468	78	307	1,468	105	1,978	1,570	678	203	47	207	1,351	12,058
1984	972	142	26	1,327	490	78	324	1,474	117	2,343	1,651	744	218	290	239	1,387	13,064
1985	1,086	111	32	1,197	517	80	339	1,490	124	2,153	1,811	831	208	367	231	1,227	13,051
1986	1,023	95	58	1,088	500	90	351	1,500	157	2,303	1,926	829	222	327	263	1,074	13,034
1987	1,119	142	110	1,375	500	100	281	1,510	209	2,415	2,054	831	208	350	254	1,241	14,019
1988	1,118	232	124	1,443	507	110	252	2,500	227	2,359	1,552	1,063	200	353	208	1,661	15,484
1989	1,075	267	114	1,371	545	125	156	2,500	239	2,400	1,840	1,003	180	668	228	2,008	16,425
1990	1,173	311	171	1,501	655	130	150	2,500	238	2,425	1,930	832	161	500	243	2,121	16,600
1991	1,180	376	154	1,339	678	150	171	2,200	265	2,295	1,927	899	171	182	239	1,860	15,600
1992	1,218	282	162	1,220	1,029	170	178	900	333	2,098	1,614	798	183	160	210	1,800	14,600
1993	1,092	333	155	896	970	200	137	900	215	2,420	1,631	767	192	180	255	1,640	14,200
1994[§]	1,045	352	155	740	983	210	133	800	258	2,330	1,742	1,064	196	132	276	1,490	14,000
1995[‡]	920	410	155	1,195	1,032	250	100	800	258	2,400	1,908	1,000	174	135	268	1,640	14,600

[*] Shipments.

[†] Formerly part of the U.S.S.R.; data not reported separately until 1992.

[‡] Estimate.

[§] Preliminary.

Source: U.S. Geological Survey.

TABLE 19–3

World Silver Consumption, in millions of troy ounces[*]

Year	Canada	France	Germany	India	Italy	Japan	Mexico	United Kingdom	United States	World Total
1974	10.3	21.0	55.0	15.0	38.6	46.5	10.2	25.0	176.0	470.0
1975	10.3	21.0	38.9	13.0	28.9	46.4	8.8	28.0	157.7	407.7
1976	9.3	31.8	52.9	18.0	32.1	60.7	10.2	28.0	170.6	484.7
1977	9.1	32.6	48.1	17.6	33.8	63.2	8.6	32.2	153.6	459.9
1978	9.6	24.6	42.0	20.0	41.8	64.9	9.1	29.0	160.2	452.4
1979	7.3	24.1	39.8	19.0	33.3	68.8	8.6	27.6	157.3	448.2
1980	8.7	19.8	31.9	19.0	21.8	61.5	4.9	19.5	124.7	364.3
1981	8.5	18.9	29.3	19.0	21.5	59.6	5.0	18.4	116.7	355.4
1982	9.0	17.1	32.7	16.1	20.8	63.2	5.7	18.1	118.8	361.4
1983	8.9	16.5	30.3	12.9	15.0	72.1	3.5	17.7	116.3	356.5
1984	9.3	17.1	32.2	16.1	19.4	78.8	5.5	19.2	114.8	376.2
1985	9.1	17.0	34.1	20.9	23.9	72.6	8.0	19.1	118.7	500.0
1986	9.6	17.1	36.3	22.5	33.7	78.5	7.7	19.0	118.9	542.3
1987	10.4	17.6	39.1	20.1	38.6	90.9	6.9	21.1	115.1	538.7
1988	11.0	21.3	44.0	22.4	37.9	100.4	7.1	22.8	112.0	568.6
1989	12.0	22.1	46.7	25.6	43.1	100.8	7.2	24.6	120.0	599.2
1990	4.0	22.4	51.7	42.3	45.7	106.9	14.1	24.7	118.9	651.8
1991	3.8	26.9	52.2	44.9	57.4	109.3	14.3	24.7	112.3	672.3
1992	1.6	29.7	49.3	58.1	61.1	105.4	15.6	26.3	114.5	687.7
1993	1.6	29.0	45.6	109.9	57.4	105.5	16.4	27.6	117.4	729.4
1994	1.6	29.2	45.8	91.2	52.8	108.5	16.1	31.2	124.3	715.8
1995[†]	2.0	32.3	44.1	97.5	50.8	112.7	18.5	32.3	132.2	741.6

[*] Non-communist areas only.

[†] Preliminary.

Source: The Silver Institute.

ond largest use of silver is for electrical purposes—silver is used because it conducts electricity and heat very effectively and does not oxidize in air.

Silver is also used for batteries (for which purpose silver is superior to lead) and for dental and medical purposes. In addition, silver is used for jewelry, silverware, mirrors, and medals and coins. The use for official coins has decreased significantly worldwide in recent years.

Price Determinants Silver futures prices are related to spot silver prices on a "carry basis"; that is, the silver futures price equals the spot price of silver plus the costs of financing, storage, and insurance over the period until delivery on the futures contract.

As suggested above, the spot price of silver is determined mainly by industrial use rather than monetary value. The exception to this is that the value of gold, as discussed above, is determined primarily by monetary value and the price of silver is loosely related to the price of gold by the gold-silver ratio as discussed above. Via the gold-silver ratio, silver prices also continue to be indirectly linked to the factors that affect the price of gold, such as the level of interest rates, inflation, the balance of payments, and economic growth.

The value of silver, on an industrial basis, is determined by the balance between supply and demand. Over the last several years, the industrial use has exceeded the newly mined supply, with the supply deficiency coming from secondary sources. The demand for silver for monetary uses has also declined. Overall, however, the demand continues to exceed the newly mined supply.

Supply factors include silver stocks and inventories held by suppliers and users of silver, the level of production in various countries, political factors such as labor strikes in producing countries, and the discovery of new sources of silver. The level of demand for various uses, including photography, medical and dental applications, silverware, and jewelry, represents the demand side. Secondary supply, including the level of hoarding and dishoarding of silver, which in turn depends on the level of prices, also affects prices. The interaction between supply and demand and, at times, "market psychology" determine silver prices.

Futures Contracts As with gold, speculators can speculate in silver with bullion, jewelry, and coins (particularly from Canada, Mexico, and Hungary). But futures contracts are the most popular speculative vehicles for silver.

There are three domestic silver futures contracts. The only significant difference between them is in size. The most heavily traded silver futures contract, at Comex, is based on 5000 ounces; it has recently been the sixth largest futures contract in terms of trading volume. Since a standard silver bar is 1000 ounces of 0.999 fine silver, this contract represents 5 bars. Both the Chicago Board of Trade and the MidAmerica Exchange have contracts based on 1000 ounces of silver (1 bar). All are for 0.999 fine silver.

The London Metal Exchange (LME) trades a futures contract based on 10,000 ounces of 0.999 fine silver. The trading of the LME contract is dissimilar to that of the three U.S. futures contracts in that the LME contract is much more like a forward contract, as discussed below.

Beginning on October 4, 1984, Comex also listed an option on its silver futures contract, and it has developed considerable liquidity. It provides the types of opportunities for speculation as discussed in Chapter 9 with regard to other options on futures contracts.

Speculative Uses Silver producers, traders, fabricators, and other users use the silver futures contracts to hedge their inventories and prospective purchases of silver. These uses are consistent with the predominant industrial use of silver.

The use of the silver futures contracts is also popular with speculators. The major reasons for speculators' interest in silver are that silver, like gold, is a quasi-monetary metal, and it exhibits extreme price volatility. Silver prices rose from approximately $5 per ounce during 1978 to over $50 per ounce in January 1980 during the publicized buying spree by the Hunt family.[1] Silver prices retreated to below $5 during 1982, rose to over $12 during early 1983, and fell back to below $6 during 1985. Silver prices failed to sustain an uptrend during the Gulf War of 1990 and have been flat to lower during much of the 1990s. Figure 19-3 shows the price of silver from 1982 to 1997.

The factors to consider when speculating in silver futures are:

- The gold-silver price ratio and, indirectly, the factors, mentioned above, that affect gold prices
- The industrial demand for silver for medical, photographic, and other purposes
- The demand for gold for jewelry

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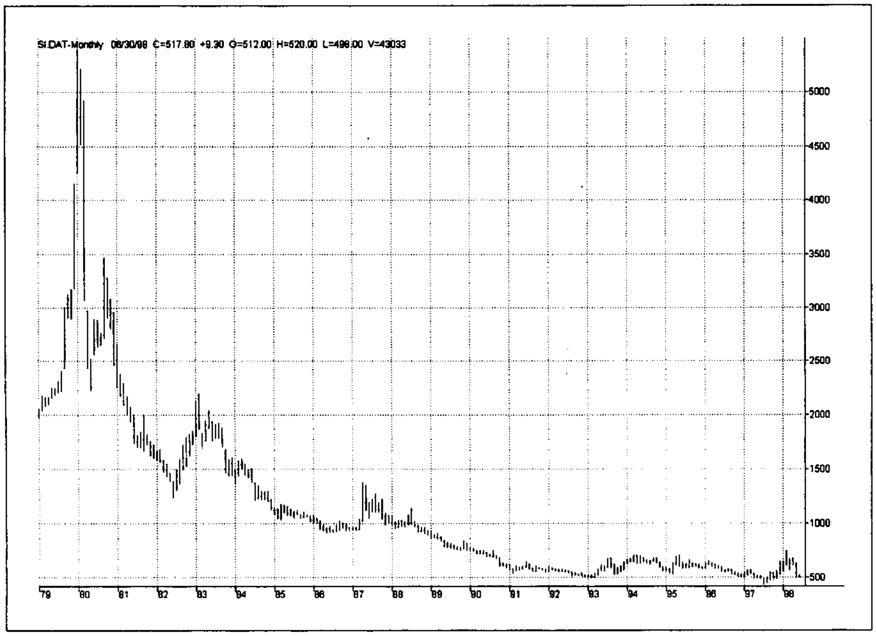
[1] For an interesting description of this episode, read *Beyond Greed,* by Stephen Fay (New York: The Viking Press, 1982).

FIGURE 19-3

Silver futures, 1982–1997.



- The level of silver stockpiles and inventories
- The psychology of silver—most important, as with all other commodities

Platinum

Introduction The platinum group metals (PGMs) comprise six closely related metals: platinum, palladium, rhodium, ruthenium, iridium, and osmium, which commonly occur together in nature and are among the scarcest of the metallic elements. Along with gold and silver, they are known as "precious" or "noble" metals. They occur as native alloys in placer deposits or in lode deposits associated with nickel and copper.[2]

PGMs have become critical to industry because of their extraordinary physical and chemical properties, the most important of which is their

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[2] Roger Loebenstein, USGS Minerals Information website.

usefulness as a catalyst. Automobile manufacturers have used catalytic converters made of platinum, palladium, and rhodium for over 20 years.

Platinum is white and can be given a beautiful, permanent polish. Under normal conditions, platinum is virtually inert and resistant to all acids.

Supply Nearly all the world's supply of PGMs is extracted from lode deposits in four countries—the Republic of South Africa, the former Soviet Union, Canada, and the United States. South Africa is the only country that produces all six PGMs in substantial quantities. South African ores are typically 60 percent platinum and 25 percent palladium. In the FSU, platinum is produced mainly as a by-product of gold and copper refining. Canadian platinum is mostly a byproduct of nickel production. The United States produces a small amount of the metal. Table 19-4 provides the supply of refined PGMs by country. Table 19-5 shows the major users of platinum by industry.

Demand Although, because of its high value, platinum can be considered a precious metal, it has limited use for coins or for hoarding. In addition, only a small amount is used in jewelry (the use for jewelry is less than 5 percent of total use).

The automobile industry has become the major user of platinum, accounting for approximately 50 percent of total U.S. use. The use of platinum in catalytic converters for emission control (that is, for reducing the emission of unburned hydrocarbons and carbon monoxide) began in the 1975 model year. Platinum is used in the catalytic converters because it can withstand high temperatures and is resistant to attack by acids and other gases.

About 25 percent of U.S. platinum use is by the petroleum and chemical industries, where platinum is used mainly as a catalyst in the production of gasoline, plastic, fertilizers, and explosives. Platinum is also used in the electrical industry (for example, as a catalyst in fuel cells), for medical purposes (including its use in pacemakers), and in the glass industry. The United States is the world's largest consumer of platinum.

Pricing Platinum futures prices are based on the cost of carry; that is, the futures price equals the cash price plus the cost of carrying the metal until futures delivery day, similar to the pricing of gold and silver futures contracts. Since platinum is primarily an industrial metal, its price is based mainly on the balance between supply and demand. Among the major fac-

TABLE 19–4

World Mine Production of Platinum Group Metals, kilograms

		Canada				Japan		Russia			South Africa			United States		
Year	Australia	Platinum	Palladium	Total	Colombia	Platinum	Palladium	Platinum	Palladium	Total	Platinum	Palladium	Total	Platinum	Palladium	World Total
1986	543	5,242	5,486	12,190	447	663	1,453	30,000	81,000	121,300	73,100	32,300	123,200	W	W	260,193
1987	620	4,354	5,910	10,930	638	753	1,417	31,000	83,000	124,400	78,400	33,900	128,000	780	2,330	270,281
1988	517	5,393	5,643	12,541	815	647	1,170	32,000	85,000	127,500	80,322	34,400	131,722	1,240	3,730	280,282
1989	500	4,467	4,676	10,389	973	1,031	821	32,000	85,000	127,500	82,884	35,800	133,684	1,430	4,850	281,629
1990	500	5,044	5,269	11,709	1,316	1,425	1,047	31,000	84,000	125,000	87,813	38,300	141,913	1,810	5,930	291,015
1991	500	4,683	6,439	11,120	1,603	988	1,053	30,000	82,000	121,500	88,861	38,000	126,900	1,500	5,200	287,000
1992	500	4,800	5,800	10,600	1,956	629	986	28,000	70,000	98,000	94,891	41,000	135,900	1,600	5,400	280,000
1993	500	5,000	6,000	11,000	1,720	661	1,180	20,000	50,000	70,000	109,000	48,000	157,000	2,100	6,800	276,000
1994*	500	6,000	7,000	13,000	1,080	700	1,280	15,000	40,000	55,000	114,000	47,800	161,800	2,000	6,400	269,000
1995†	500	6,040	7,100	13,140	1,100	580	2,000	18,000	48,000	66,000	118,000	49,400	167,400	1,600	5,300	286,000

W = Withheld proprietary data.

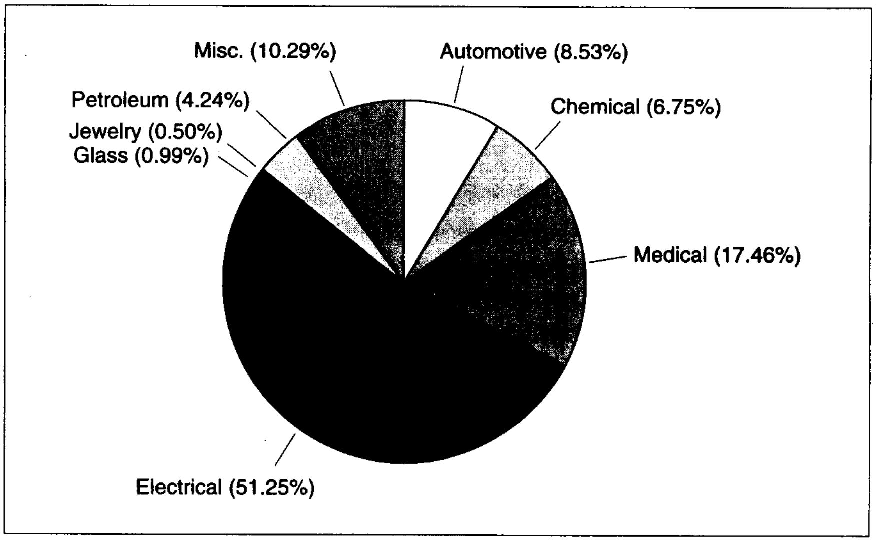
*Preliminary.

†Estimate.

Source: U.S. Geological Survey.

TABLE 19–5

Platinum Use by Industry



Source: USGS.

tors that affect this balance are mine output, secondary production, and automobile sales. The degree of U.S. government stockpiling of platinum, another important price determinant, has varied over time. Under President Reagan, stockpiling of platinum began again due to the use of platinum for defense purposes.

Because platinum is to some extent a precious metal, platinum prices are also thought to be related to gold prices. Typically, platinum prices exceed gold prices due to the relative scarcity of platinum. Due to this perceived relationship, some of the factors that affect gold prices also affect platinum prices. Among these factors are the level of interest rates, the level of economic activity, and the stability of the international political environment. However, the relationship between platinum and gold prices is extremely variable. During early 1980, the price of platinum reached $1000 per ounce and exceeded the price of gold by $300. Since then, however, platinum prices have been somewhat below gold prices at most times.

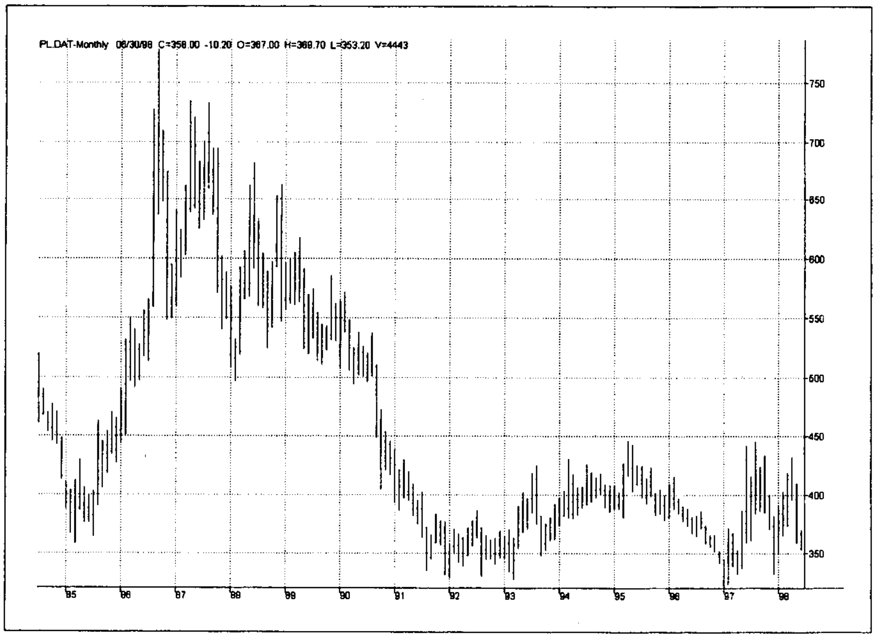
There are three different markets and prices for platinum. The producer price is the contract price between the world's principal suppliers (mainly South African mining firms) and large U.S. users (mainly automobile companies). The producer prices are set on a forward basis and are maintained at fairly stable levels. The dealer price is set by 20 to 30 metals dealers or traders who get their supplies from Russia, other producers, and secondary supply.

The third type of market and price is the futures market and price. The New York Mercantile Exchange trades a platinum futures contract based on 50 troy ounces of platinum. Both dealer and futures prices are fairly volatile.

Speculative Uses Speculators base their decisions on platinum on either of two factors. First, they can base their assessment of platinum prices on the supply-demand balance, considering platinum as an industrial metal and considering auto sales, mine production, etc. Or they can base their assessment of platinum prices on platinum as a precious metal, considering international political stability, particularly with South Africa and Russia, and interest rates. At different times, each type of assessment may be correct. As shown in Figure 19-4, platinum prices have exhibited considerable volatility.

FIGURE 19-4

Platinum Prices, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



Palladium

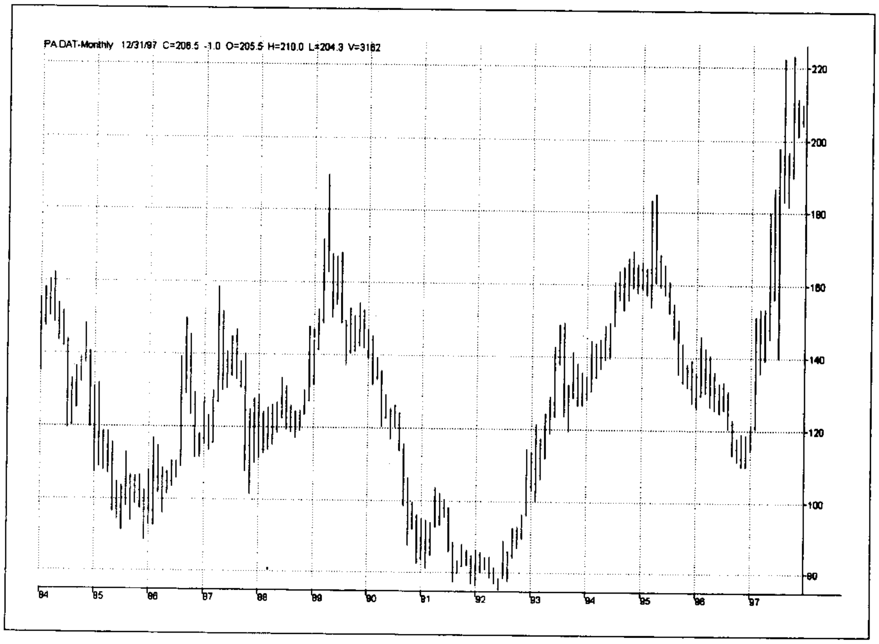
Palladium is similar to platinum in many respects—it has excellent conductive properties, is virtually inert, and can be given a beautiful, permanent polish. Due to its excellent conductive properties and low cost, the metal is mainly used in electrical applications. This accounts for approximately one-third of total U.S. use. The use of palladium in catalytic emission-control devices for automobiles accounts for about 20 percent of use. Palladium is also used in the chemical industry, for petroleum cracking and hydrogenation, and in the dental and medical fields.

In the last few years, palladium has averaged about one-half the price of platinum, mainly because it is a much less effective catalyst. Figure 19-5 shows the recent price history of palladium.

As with platinum, there are three different markets and prices for palladium, originating from producers, dealers, and futures markets. For palladium, producer prices are relatively stable, and dealer and futures prices are more volatile.

FIGURE 19–5

Palladium prices, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



The New York Mercantile Exchange trades a palladium futures contract based on 100 troy ounces of metal. The delivery mechanisms for both the platinum and palladium futures contracts is a certificate or depository receipt from a depository which is in the New York metropolitan area and which is approved by the exchange.

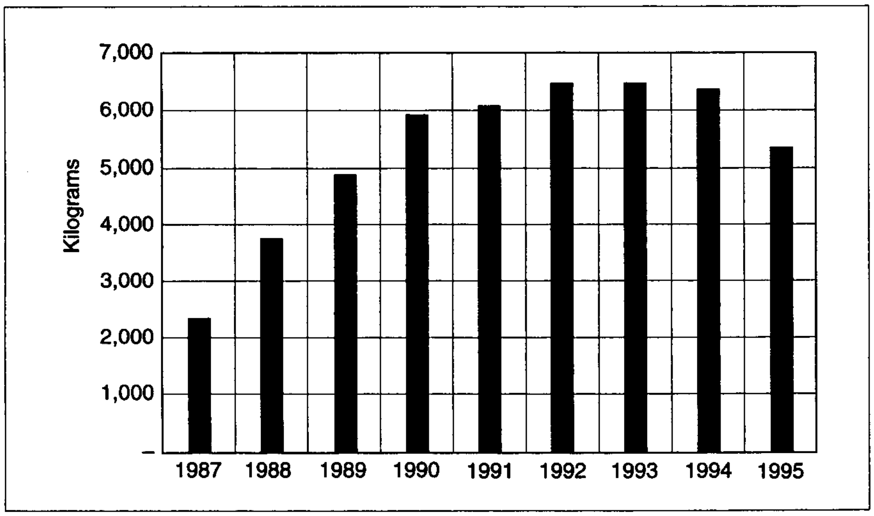
Speculation on palladium is based on many of the same factors affecting palladium. Since palladium is not regarded as a precious metal, however, there is not active spread trade between it and gold. International political considerations are relevant in the trade of palladium, since the bulk of supply originates from two regions (South Africa and the FSU) that have somewhat unstable relationships with the United States. Salient statistics on supply and demand for palladium are shown as Table 19-6.

Notes from a Trader—Precious Metals

Gold has been a major speculative vehicle for several years. Fundamentalists consider gold primarily as a financial asset and, in this regard, as an inflation hedge. When inflation is high, interest rates are high, while bond

TABLE 19-6

Palladium mine production.



Source: U.S. Geological Survey.

prices are low, and gold prices are high. Thus, interest rates are a major fundamental determinant of gold prices. The politics of gold is important, involving the politics of the producing countries, mainly South Africa and Russia, and of major holding and using countries, most importantly the United States.

The gold market is a very technical market. At times, gold has shown sustained trends—upward, downward, and sideways. At times, also, gold shows considerable short-term variability, and at other times it will have a price movement similar to the surface of a bowling alley. The most uncertain and unstable times are the times of highest gold prices. The gold futures contract is very liquid, particularly during unstable times.

Silver prices tend to follow gold prices at times through the gold-silver ratio, but they march to their own beat at other times. Silver prices can be very volatile for short periods of time and stable for long periods of time. Do not take a vacation at the wrong time with a silver position.

The markets for platinum and palladium are much smaller and less liquid than the gold and silver markets. The deliverable supplies of these metals are also much smaller than those of gold and silver, and so small changes or potential changes in supply can cause significant price changes.

INDUSTRIAL METALS

In addition to the precious metals, there are also futures based on six industrial metals—copper, aluminum and aluminum alloy, lead, zinc, nickel, and tin. Copper is traded on the New York Commodity Exchange (COMEX); the rest of the industrial metals are traded on the London Metal Exchange (LME).

Copper

Introduction Copper-smelting operations have been traced back 7000 years; modern history and growth in demand for copper began with the discovery and commercial development of electricity in the latter part of the nineteenth century. The majority of copper is used in electrical and electronic devices, composing more than 70 percent of U.S. consumption. Copper ranks third in world metal consumption after steel and aluminum. Copper and copper alloy scrap compose a significant share of the world's supply. In the United States, about 44 percent of total annual copper consumption was from copper in old and purchased new scrap. The largest international sources for scrap are the United States and Europe. Most U.S. trade in copper scrap is with the Far Eastern countries such as South Korea, Taiwan, and Japan.[3]

Supply Copper is produced in open pits, and large amounts of earth and ore must be moved to produce the metal. This process requires large amounts of capital and labor; in addition, it has recently encountered government pollution controls. All of these factors have increased the cost of copper production.

Copper is mined mainly in the form of copper sulfide ore, which also typically contains trace amounts of gold, silver, and platinum. Pure copper is produced from copper ore via a three-step process: milling, smelting, and refining. The milling process is essentially crushing and grinding the copper ore and producing copper concentrates by putting the output of these processes through a flotation process. Smelting, by applying intense heat to the copper concentrates, produces blister copper containing approximately 99 percent pure copper. Pure copper is then produced by electrolytically refining the blister to remove the remaining impurities. The output of the refinery stage is copper cathode—approximately 300 pounds of 3½-foot squares of 99.9 percent pure copper—the most common form of copper traded.

Copper production results from newly mined copper and the processing of scrap copper. Newly mined copper comes mainly from four areas in the world—the western slopes of the Andes mountains in Chile and Peru, South Africa (mainly Zaire and Zambia), the U.S.S.R., and North America, including the United States and Canada. As shown in Table 19-7, these countries account for approximately 65 percent of the world's mine production. U.S. mine production comes mainly from the western states, with Arizona responsible for 65 percent of the U.S. total.

Open-pit mining continues to be the dominant method of copper production. As mines have tended to be depleted, the grade of ore mined has declined over time, but increased productivity due to better technology and recovery methods has tended to offset this effect on the cost of producing copper.

The recycling of copper is feasible due to copper's resistance to corrosion. The secondary, or scrap, production of copper has been an increas-

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[3] Janice Jolly, USGS Minerals Information website.

TABLE 19-7

Ten Largest Copper-Producing Countries (thousand metric tons)

1 Chile	1,588
2 United States	1,588
3 FSU	950
4 Canada	794
5 Zambia	420
6 Zaire	373
7 Poland	370
8 Peru	334
9 Australia	330
10 Mexico	299
Total	7,046
Total world production	9,036

ing source of copper. Table 19-8 provides other data on the supply, stocks, and trading of copper in the United States.

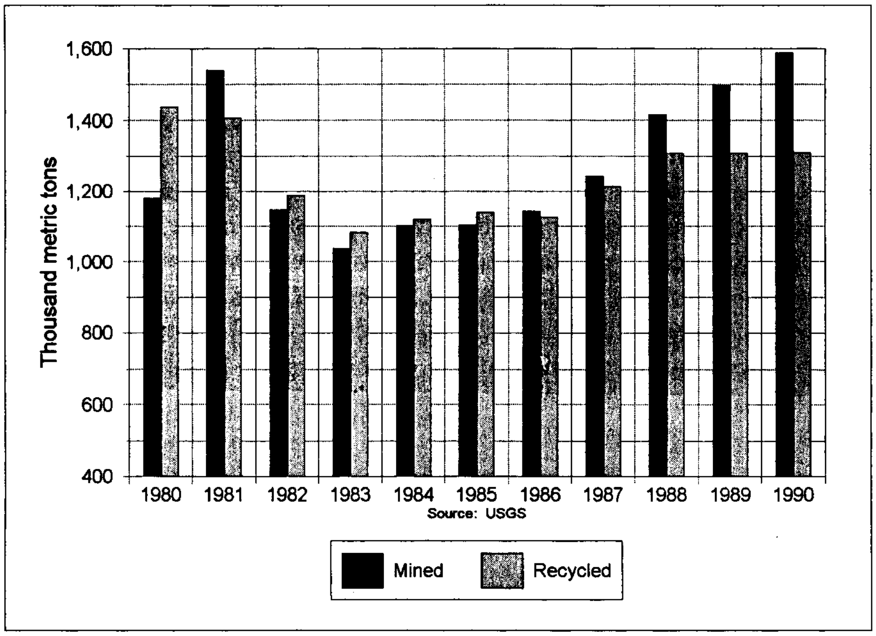
Demand Copper is exclusively an industrial metal; thus, refined copper is consumed mainly by developed countries. Its industrial use is based on its excellent electrical and heat conductivity, corrosion resistance, strength, ductility, and malleability. Copper may also be easily alloyed with nickel and silver.

The United States is the largest consumer of copper, followed by the U.S.S.R. and Japan. These three countries together account for approximately one-half of the world's total consumption. While the United States and the U.S.S.R. are also major producers, Japan must import most of its copper. Other industrial countries, such as the United Kingdom, West Germany, and China, are also major users of copper.

Copper is used in a wide variety of applications. The largest use of copper is, due to its electrical conductivity, in the electrical industry. In this industry, it is used for wiring and electrical parts in electronic and telecommunications applications, including radios and televisions. Copper is also used in plumbing because of its resistance to corrosion. Due to this corro-

TABLE 19–8

U.S. Copper Production



Source: USGS

sion resistance and its ability to conduct heat, it is used in radiators, cooling systems, and solar heating applications. In these uses, copper is used substantially by the housing and automobile industries.

Copper is also used in coins and jewelry because of its strength and shiny appearance. Finally, copper is used in the production of brass and bronze, as well as in many other alloys.

Price Determinants While much copper is mined by developing countries, most copper is consumed by the industrial, developed countries. Thus, copper exports are an important source of foreign exchange for the developing copper-producing countries. Since no single nation has a monopoly on the source or production of copper, copper is a world commodity.

Because copper is a commercial metal, used particularly by the housing, automotive, and electrical industries, its demand is affected by the general state of the economy and, in particular, by the state of the housing and automotive sectors of the economy. Thus, during recessions or economic slowdowns, the demand for copper declines and its price softens. On the other hand, copper usage typically increases when the economy is strong, and the price of copper, therefore, increases. Copper prices are, thus, fairly volatile over the business cycles.

Increases in the price of copper are, however, limited, particularly when the economy is strong, by competition from substitutes such as steel, plastic, aluminum, and, more recently, fiber optics.

On the supply side, labor negotiations and strikes involving the major copper-producing companies in both the developing and developed countries affect copper supplies and, thus, prices. Copper inventories serve as a buffer and, depending on the level of inventories, can affect prices either positively or negatively. In addition, political and social disruptions, particularly in developing countries, affect copper supplies and prices. Disruptions in the international transportation system may also affect copper prices.

There is an important seasonal in copper prices that relates to the use of copper in housing and automobile production. Copper prices tend to be strong in the early spring due to the purchase of copper by the housing and automobile industries for their peak production levels during late spring and summer. Copper prices, thus, usually reach peaks during the February–April period. After the peak demand during late spring, copper demand declines during the summer, and prices soften during the summer and fall. The strength of the production cycles, particularly those related to housing starts, affects the degree of price increase during the early spring.

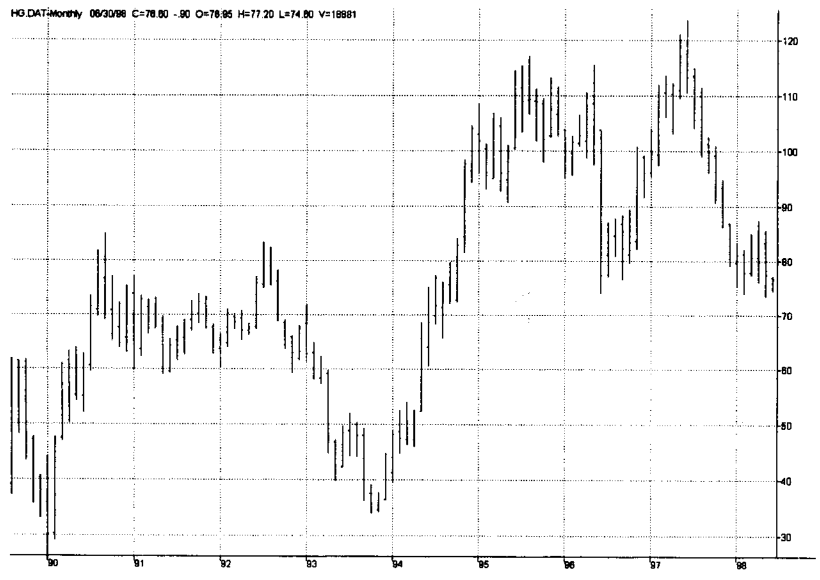
Copper prices have exhibited considerable volatility, as shown in Figure 19-6.

Futures Contracts There are two active copper futures contracts. A copper futures contract has been traded at Comex since 1933. And a copper futures contract has been traded at the LME (London Metal Exchange) since 1883. Thus, copper is the basis for one of the oldest commodity futures contracts in existence.

The Comex futures contract is based on 25,000 pounds of copper electrolytic cathodes. Electrolytic wirebars and ingot bars, fire-refined high-conductivity ingot bars, and fire-refined ingot bars are also deliverable at various premiums and discounts. The trading months are the three nearby months and the January, March, May, July, September, and December months up to 23 months in the future.

FIGURE 19-6

Copper prices, 1989–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



The LME trades all of its futures contracts quite differently from Comex. The LME does not have a central clearinghouse which stands between all trades, collects initial margin, and marks each position to-the-market. In the LME, rather, each trader, or ring dealer, is a principal, that is, the guarantor of its trades. In addition, margins are not collected, and positions are not marked to-the-market. This system is, thus, based on member financial solvency.

The LME trades two copper futures contracts. The first, which is quite active, is a contract based on high-grade copper wirebars and copper cathodes. The second is based on standard copper cathodes and is less actively traded. Each contract is based on 25 metric tons.

The LME trades on the basis of specific dates, spot and 3 months forward, rather than specific futures months as at Comex and other U.S. futures exchanges. Delivery is via warehouse receipts from warehouses throughout Europe.

In general, the quality of copper cathodes deliverable on the LME contract is slightly higher than the quality of copper cathodes deliverable at Comex, so the LME cathode contract is traded at a slight premium to the Comex contract.

Aluminum

Introduction Aluminum is the second most abundant metal in the Earth's crust after silicon, yet it is a comparatively new industrial metal that has been produced in commercial quantities for only the last 100 years. Measured in quantity and value, aluminum's use exceeds that of any other metal except iron and is important in virtually all segments of the world economy.

Although the United States continues to be the leading producer of primary aluminum metal in the world, its dominance in the industry has begun to wane. In 1960, the United States accounted for slightly more than 40 percent of the world's production. In 1990, the U.S. share of world production had decreased to 23 percent. Most of the restructuring of the world aluminum industry began in the late 1970s and continues to this day. Australia and Canada have emerged as major metal producers. Other countries entering the world market today are Brazil, China, Norway, Venezuela, and several countries in the Persian Gulf.[4]

Supply Despite the abundance of aluminum, its wide distribution around the world, and its versatility, the large-scale production and, thus, the significant usage of aluminum did not occur until the late 1800s. A major reason for the delay in the utilization of aluminum was that aluminum, unlike many other metals, is not found free in nature. It is found combined with oxygen in an ore called bauxite. Bauxite is found on all continents except Antarctica, with most of it in Jamaica, Australia, Brazil, and Africa. The United States and Russia have very little bauxite. Most bauxite ore is at the earth's surface, and it can be mined in an open-pit manner.

Recently, Australia has been the biggest producer of bauxite, with approximately 30 percent of the world's total. Guinea (17 percent), Ja-

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[4] Pat Plunkert, USGS Minerals Information website.

maica (14 percent), and Surinam (7 percent) are also major bauxite producers. In 1974, the International Bauxite Association (IBA) was formed to help bauxite-exporting countries increase their control of supply. Almost 90 percent of the western world's bauxite reserves are in IBA members.

In 1886, Hall in the United States and Heroult in France independently discovered the electrolytic process for producing aluminum metal. Two years later, Bayer in Austria discovered the chemical process for treating bauxite. These two processes are still the basis for producing aluminum.

The production of aluminum from bauxite is a two-step process. In the first step, called *refining*, basically still using Bayer's process, most of the oxygen is removed from bauxite, and a nonmetallic white powder called alumina is produced by a series of chemical processes. The remainder of the oxygen is then removed from alumina to produce aluminum in the second step, called smelting, via the process developed by Hall and Heroult. In this process, which is very energy-intensive, alumina is dissolved, and the oxygen is separated from the aluminum electrically. Smelter aluminum is 99.50 percent pure. Further refining can produce 99.90 percent pure aluminum.

Pure aluminum is malleable and corrosion-resistant and is an excellent conductor of electricity, but it lacks strength and hardness. For this reason, aluminum is usually alloyed with other metals, typically copper, manganese, magnesium, silicon, and zinc, to improve its properties. Aluminum can also be easily fabricated into many shapes by various metalworking processes, such as rolling, forging, drawing, and extruding.

Until World War II, Alcoa (the Aluminum Company of America) represented 100 percent of the U.S. aluminum capacity, and the United States produced 45 percent of the world's total. But more than 42 countries now produce aluminum. As shown in Table 19-9, the United States is the world's leading producer, followed by the former Soviet Union, Canada, and Australia. Six large integrated corporations have ownership of 40 percent of the world's aluminum production capacity. They are the Aluminum Company of America (Alcoa), Reynolds Metals Co., and Kaiser Aluminum & Chemical Corp. in the United States, Alcan Aluminum, Ltd. (Alcan) in Canada, Alusuisse International N.V. in Switzerland, and Pechiney Ugine Kuhlmann in France. However, governments, mostly of developing countries, have significant ownership of the world's aluminum production capacity. But the government-owned share declines from stage

TABLE 19–9

Production of Primary Aluminum by Country, thousand metric tons

Argentina	166
Australia	1,234
Austria	89
Bahrain	213
Brazil	931
Cameroon	93
Canada	1,567
China	850
Czech Republic	70
Egypt	179
France	326
Germany	736
Ghana	174
Greece	150
Hungary	75
Iceland	88
India	433
Indonesia	186
Iran	59
Italy	232
Japan	34
North Korea	10
South Korea	2
Mexico	68
Netherlands	270
New Zealand	308
Norway	845
Poland	46
Romania	178
South Africa	170
Spain	355
Surinam	32
Sweden	96
Switzerland	72
Turkey	61
FSU	3,300
Dubai	168
United Kingdom	297
United States	4,030
Venezuela	540
Yugoslavia	331
Total	19,100

Source: USGS.

to stage in the production process. Government-owned capacity is responsible for over one-half of the world's bauxite, one-quarter of its alumina, and less than 20 percent of its aluminum. Political and economic actions taken by these governments, thus, can significantly affect aluminum supplies.

As with other metals, secondary supplies are an important part of the total supply of aluminum. Secondary supplies have been responsible for about one-third of total supplies. "Old scrap" comes mainly from beverage cans and automobiles. "New scrap" is produced by fabricators and is usually recycled immediately.

Demand Because of aluminum's desirable physical and chemical properties, including its light weight and strength, its many applications and total use have been growing significantly. In many applications, it has replaced other materials, such as glass and tin in bottles and cans, copper in the electrical uses, and zinc in the automobile industry.

The largest use of aluminum is in the beverage and food packaging industry, which accounts for approximately one-third of aluminum's total use. Aluminum's use for siding, windows, doors, and screens by the building and construction industries accounts for about one-fourth of its total use. The transportation sector, including cars, buses, trucks, and bicycles, accounts for about 12 percent of the U.S. use of aluminum. The electrical sector accounts for approximately 12 percent, using aluminum for power transmission and electrical machinery. Air conditioners, refrigerators, cooking utensils, and other consumer products account for about 7 percent of aluminum's total U.S. use. The use of aluminum in other machinery and equipment, paint, explosives, and defense applications (aluminum is one of the four controlled materials in the U.S. Department of Commerce's Defense Materials System) accounts for most of its remaining use.

Price Determinants Aluminum prices are determined on the basis of the supply and demand factors discussed above. Overall, the supply of aluminum is more broadly based and more economically, as opposed to politically, determined than copper supply. In addition, aluminum's sources of demand are broader and have smaller seasonal and cyclical influences than copper's. These considerations tend to make aluminum prices more rationally based and less volatile. However, since aluminum and copper are substitutes in many applications, factors that affect one tend also to affect the other to some extent.

To some extent, as in platinum and palladium pricing, there are three types of pricing in the commercial exchange of aluminum. Traditionally, the first type of price, the producer price, has been set by major producers of aluminum as a long-run equilibrium price to assure stable prices for producers and consumers. Producer prices are the last to increase in a strong market and the last to decrease in a weak one. These prices for refined output were initiated by oligopolistic producers who controlled production at all levels.

But as the aluminum market has become more competitive and secondary sources of aluminum have become more important, another level of pricing, merchant pricing, has increased in importance. Metal merchants, or dealers, buy aluminum outside the producer market via secondary smelters, independent refiners, and manufacturer inventories. They then sell to mills and manufacturing firms which cannot obtain it from producers at the time. This market has grown in size and importance since the 1970s. Merchant prices are more volatile than producer prices.

A third type of price, the futures price, has become important since the introduction of aluminum futures contracts in 1978 and 1983. Futures prices, like merchant prices, are fairly volatile.

Since aluminum smelting is very energy-intensive, energy prices have an important effect on aluminum prices. The availability and cost of capital for all stages of aluminum production and technological advances in the production processes also have important effects. Since developing countries are significant at all stages of the aluminum production process, their political and economic policies affect aluminum prices.

Since aluminum is used in both many consumer applications and many industrial applications, its demand is not as volatile over the business cycle as the demand for metals that have few uses or are used solely for industrial applications.

Futures Contracts Aluminum contracts began trading on the London Metals Exchange in 1978 and represent the only available exchange-traded location for the metal. There are substantial differences in the trading methods of the LME and traditional futures markets in the United States; the most important difference is that the LME trades spot and 3-month forward contracts, as opposed to specific contract months.[5] Also, on the LME the ring dealers are the principals of the exchange and are responsible for all clearing—hence, there are no formal margin requirements (margins are set by each broker).

The LME uses U.S. dollars as its major currency for each contract, the currency in which dealings on the floor are transacted and which is used for the announcement of the official prices. However, British pounds, German marks, and Japanese yen also constitutes good currencies for clearing purposes for all LME metals. The LME announces the exchange rates each day that the clearinghouse will use for evaluating the settlement prices.

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[5] Because the LME does not offer contracts on specific contract months, it is actually a forward market, as opposed to a futures market.

Speculative Uses Aluminum futures are used to speculate on the price of aluminum on the basis of the factors discussed above. On the one hand, aluminum prices can be thought to be less volatile than copper prices because the main use of aluminum is for packaging, a consumer staple good, the demand for which is less volatile than the demand for copper on both a seasonal basis and a cyclical basis—the major uses of copper (housing, automobile, and industrial uses) have, as discussed above, significant seasonal and cyclical variations. On the other hand, aluminum is a substitute for copper in many industrial applications, which argues for aluminum and copper prices being closely related and similarly volatile. It is these similarities and differences that make the "all-copper" spread an interesting basis for speculation. This spread may become as popular as the gold-silver and soybean crush spreads.

Typically, aluminum prices are lower than copper prices. However, aluminum went to a premium over copper in 1983 for the first time since World War II for supply-demand reasons. During the preceding recession the demand for both copper and aluminum decreased. While aluminum producers curtailed production, copper producers, mainly developing country-owned facilities that needed the foreign exchange from copper exports, continued production. During the ensuing recovery, when the demand for both aluminum and copper increased, there were greater inventories of copper, and, thus, the supply of copper increased more quickly, causing aluminum prices to increase more than copper prices. For such reasons, the aluminum-copper spread is, to some extent, an economic-political supply spread.

Another important aspect of this spread relates to energy costs. Aluminum production is much more energy-intensive than copper production, so changes in energy costs, either up or down, affect aluminum prices to a greater degree. Of course, energy prices can also be used as a basis for speculating on aluminum prices alone.

Aluminum futures are priced, as other metal markets are, on a carrying-charge basis; that is, the futures price equals the spot price plus the cost of carrying the metal to the futures delivery day, mainly the financing cost. Pure aluminum time spreads can be used in ways that are similar to the ways spreads are used in other carry markets. Speculators may choose to "buy a time spread" (that is, buy the nearby contract and sell the deferred contract). They may also choose a "bull spread" if they think that supplies will be low, or tight, due to shortages in the spot market or shortages for delivery in the futures market; for example, exchange-certified warehouse receipts will not be adequate for meeting delivery requirements, or demand will be great because economic activity will accelerate.

Aluminum futures, on a naked basis, can also be used as vehicles for speculation based on other supply, demand, and pricing factors discussed in this section.

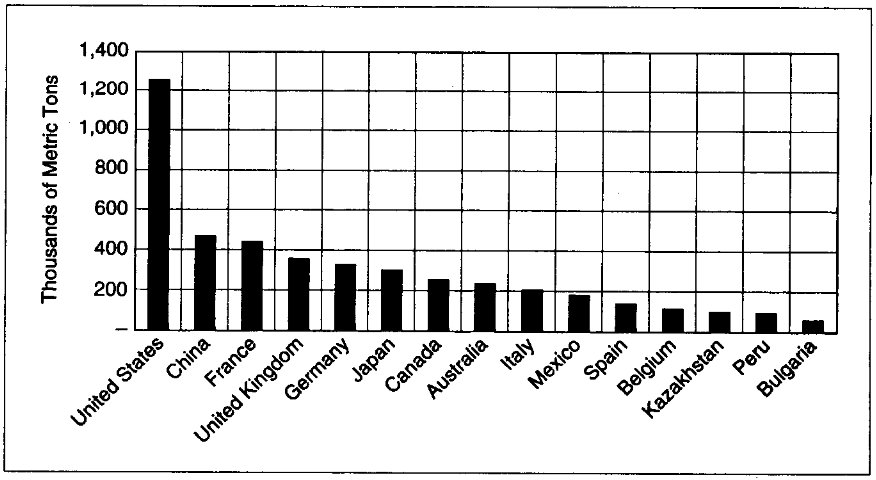
Other Base Metals

The London Metal Exchange trades four base metals in addition to aluminum. Because of their low trading volume and the LME's domination by commercial traders, these metals will be briefly summarized below. Salient statistics on these markets are shown as Tables 19-10 to 19-13.

Lead Lead is a dense, toxic, and corrosion-resistant material. The biggest use of lead is in lead-acid storage batteries. It is also used extensively in hospitals to block X-ray and gamma radiation and is employed to shield against nuclear radiation both in permanent installations and when nuclear

TABLE 19–10

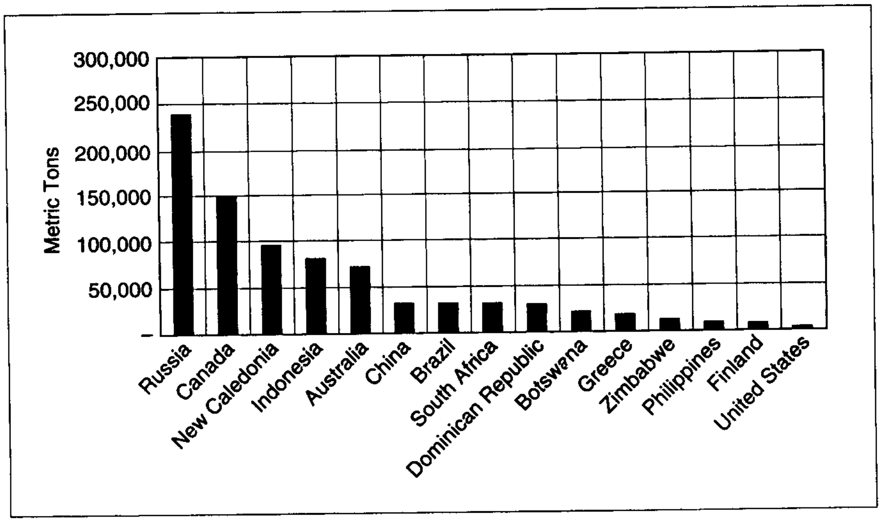
World smelter production of lead, 1994



Source: U.S. Bureau of Mines.

TABLE 19-11

World mine production of nickel, 1994.



Source: U.S. Geological Survey.

material is being transported. The metal's use as a fuel additive has been virtually eliminated because of its toxic effects on human and animal life.

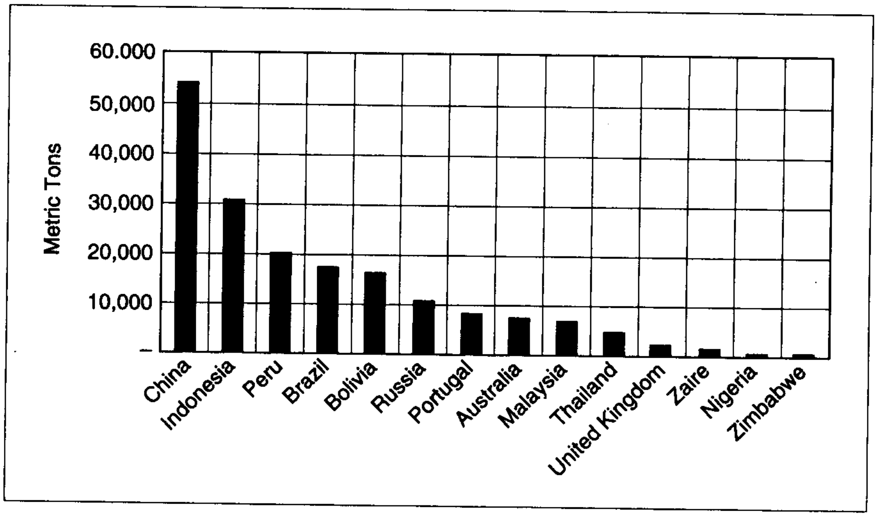
The United States is a major mine producer and by far the world's leading producer of lead. Missouri is the main producing state. Because of the great number of scrap batteries that become available each year, recycled lead supplies more than 60 percent of domestic demand. The leading foreign mine producers, with a combined output equal to the United States, are Australia, the Former Soviet Union, Germany, and Japan.

Nickel Nickel is vital to the stainless steel industry and has played a key role in the development of the chemical and aerospace industries. The metal's greatest value is in alloys with other elements, where it adds strength and corrosion resistance over a wide range of temperatures.

Tin Tin was one of the earliest metals known to humans. Because of its hardening effects on copper, tin was used in bronze implements over 5000 years ago. Today, most tin is used as a protective coating or as an alloy with other metals. Tin is used as a coating for steel cans, in solders for join-

TABLE 19–12

World mine production of tin, 1994.



Source: U.S. Geological Survey.

ing pipes or electrical conductors, and as a hardening agent in alloys. Tin is essential to an industrial society and in many applications for which there are no completely satisfactory substitutes.

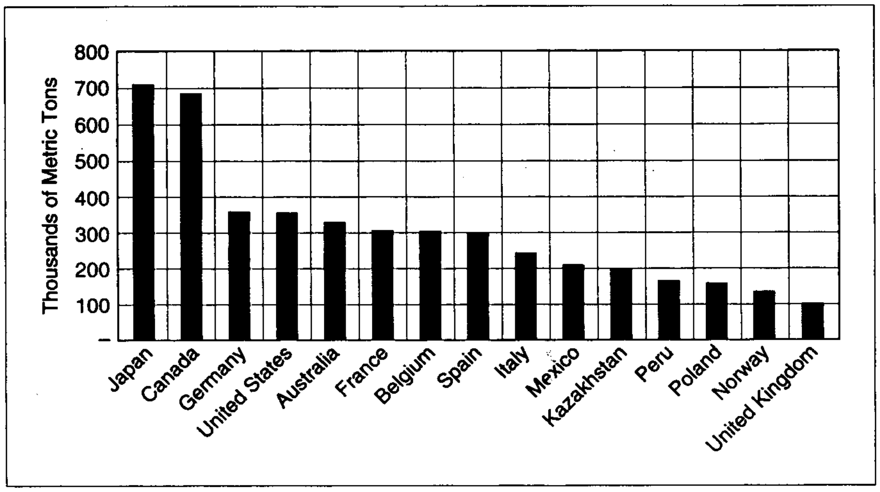
The United States is the world's largest user of primary tin. Domestic scrap tin has long been an important factor in meeting domestic needs, supplying about 20 percent of total tin demand. Domestic reserves of tin, however, are small, and large-scale mining seems unlikely in the next few decades. Almost all primary tin is imported from Southeast Asia and South America. This supply pattern has long existed and is expected to continue.

Zinc Zinc is the fourth most widely used metal after iron, aluminum, and copper. The metal is used as a corrosion-protection coating on steel, as an alloying metal with copper to make brass, and as a chemical compound in rubber, ceramics, paints, and agriculture. Zinc is also a necessary element for proper growth of humans, animals, and plants.

The United States has been the leading consumer of zinc since the early 1900s and currently consumes about 15 percent of world output. As a result of the substantial decline in domestic zinc smelter capacity,

TABLE 19–13

World Smelter Production of Zinc, 1994.



Source: U.S. Geological Survey.

reliance on metal imports remains high. The leading ore-producing countries are Canada, Australia, and the former Soviet Union.

Notes from a Trader—Commercial Metals

While the precious metals are traded more like financial assets, copper and aluminum are commercial metals and are traded like other commercial commodities such as lumber. And, in fact, copper and lumber are both closely related to the housing cycle, and announcements regarding housing may affect their prices significantly. The demands for both copper and aluminum are susceptible to replacement by existing and new materials.

20 CHAPTER

The Energy Markets

"The energy spent struggling against the inevitable could often prevent it from becoming inevitable."

This chapter focuses on the futures contracts based on petroleum and petroleum by-products. Crude oil, heating oil, unleaded gasoline, natural gas, and propane (all of various types and delivery points) are currently traded at the New York Mercantile Exchange. Gas oil and Brent crude are trade on the International Petroleum Exchange in London (IPE).

INTRODUCTION

Prior to the early 1970s, the market for petroleum and petroleum products was relatively stable. Crude oil was sold via long-term agreements between the major international oil companies, mainly the so-called seven sisters, and the producing countries. Insignificant amounts of crude oil were sold via the spot markets. Crude oil and its products, thus, showed little price volatility. Several political and economic factors changed this environment, thereby increasing price volatility and providing a need for futures contracts on petroleum and petroleum products to hedge the associated price risks.

The formation of OPEC (the Organization of Petroleum Exporting Countries) and the oil embargo during 1973 and 1974 terminated the stable petroleum distribution system, transferring much of the control of crude oil supplies and prices from the major international oil companies to the governments of the oil-producing countries.

The Iranian crisis of 1978 and 1979 continued these trends. Control continued to accrue to the oil-producing countries rather than the international oil companies. An increase in the volume of crude oil sales occurred via the spot market rather than long-term agreements. These changes led to greater price volatility, initially for crude oil and then for refined products; the development of oil-trading companies which traded on the spot markets; an increase in the share of total transactions being conducted on the spot markets; and an increase in the flexibility of independent oil companies. The entire distribution chain, from producer to refiner to wholesaler to retailer of refined products, was affected by these changes. The decontrol of domestic U.S. oil prices during 1981 continued these trends.

Oil supply and demand in the 1990s has been most affected by world political instability, including the collapse of the former Soviet Union, the Persian Gulf crises in 1990, and the continued industrial development of China and Korea. Figure 20-1 shows a chronology of oil prices from 1985 to 1997.

The ability of corporations to hedge their energy consumption—which represents the largest variable expense for many industries—has made the futures contracts on the energy complex one of the most actively traded in the world. To understand how the petroleum and petroleum-related contracts filled this need, it is necessary to understand the supply system—that is, the production and distribution system—of petroleum and its products.

SUPPLY

From the discovery in 1859 of the first large well in the United States, oil has become the greatest of the great industries that arose in the last decades of the nineteenth century. Of the top 20 companies in the *Fortune* 500, seven are oil companies. And until some alternative source of energy is found, oil will continue to have far-reaching effects on the global economy; major price movements can fuel economic growth or, contrarily, drive inflation and kick off recessions.[1]

Oil is produced in many countries of the world, as shown in Table 20-1. As a group, the Organization of Petroleum Exporting Countries

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[1] Daniel Yergin, *The Prize* (New York: Simon & Schuster, 1991), p. 14.

FIGURE 20–1

World oil price chronology, 1985–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.

1985	Oct	OPEC output hits 18 MMB/D, boosting a glut and triggering a price war.
1986	May	Iraq bombs Tehran refinery.
	Jul	Brent price dips under $9/barrel. OPEC production rises to 20 MMB/D.
	Dec	OPEC cuts production 7% in an effort to boost oil prices.
1987	Jan	OPEC price accord begins to deteriorate.
	Jun	Gulf War escalates.
1988	Jul	Iran accepts cease-fire proposal from Iraq.
	Oct	Crude oil prices jump in anticipation of possible accord at Gulf Cooperation Council meeting set for late October.
1989	Mar	Exxon tanker Valdez spills 11 million gallons of crude oil in the water of Prince William Sound.
	Jun	OPEC raises their production ceiling to 19.5 MMB/D.
1990	Aug	Iraq invades Kuwait. Prices initially rise, then fall when OPEC members increase output to cover shortfall.
	Nov	UN imposes embargo against Iraq.
1991	Jan	U.S. begins air attack against Iraq. Oil prices fall $9–10 per barrel, after having risen $5 per barrel during the first half of January.
	Dec	Soviet Union collapses.

FIGURE 20-1

World oil price chronology, 1985–1997. (*continued*)

1992	May	Saudi Arabia supports a crude oil price hike at OPEC meeting; prices exceed $22/barrel.
	Dec	U.S., Canada and Mexico sign NAFTA agreement.
1993	Nov	Combination of OPEC overproduction, surging North Sea output, and weak demand lowers the price of Brent crude to $15 per barrel.
1994	Apr	Oil prices firm on strength of institutional shifting of U.S. investment funds from equity and bond markets to cash and commodities.
1995	Jun	Exxon signs $15.2 billion deal to develop oil and gas fields near Russia's Sakhalin Island.
	Jul	Venezuela allows for foreign participation in oil production.
	Dec	Angola announces its intent to raise production by 10% per year for the next five years.
1996	Apr	President Clinton approves sale of $227 million in crude oil from Strategic Oil Reserve to stave off high gasoline prices.
	Sep	Iraq invades Kurdish safe haven. U.S. responds with missile attack; postpones Iraqi sale of oil.
1997	Jan	UN agrees to oil-for-food deal with Iraq—however, sanctions remain in effect.
	May	Turkey and Iraq begin joint venture to build a natural gas pipeline.

(OPEC) holds the largest amount of market power. The eleven members of OPEC produce nearly 40 percent of the world's oil. OPEC's share of world oil supply has remained constant since 1993 as non-OPEC oil supply has increased dramatically in the last few years, especially in the North Sea, Latin American, and West Africa. OPEC also contains nearly all the world's excess oil production capacity.[2] The largest non-OPEC oil producers are the United States, Russia, and Mexico. Table 20-2 shows the members of OPEC and their respective oil production.

From the natural resource petroleum, several petroleum products are produced through a process that is called, in general, *refining*. Currently there are futures contracts on crude oil and several petroleum products. In this sense, the futures contracts on the petroleum complex are similar to those on the so-called soybean complex. Before considering these individual futures contracts, consider, in general, the petroleum production process, called *refining*, and the nature of the products themselves.

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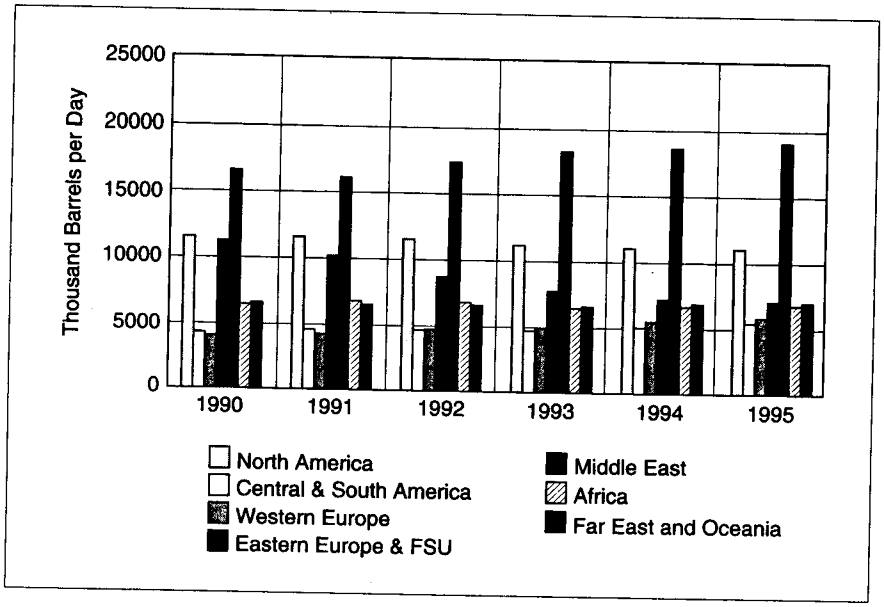
[2] U.S. Department of Energy, Energy Information Administration.

TABLE 20-1

World Crude Oil Production



Source: Energy Information Administration.

The basic process of refineries is the distillation process. Via the distillation process, a liquid is first heated to vaporize it, and the vapor, or gas, is then cooled to condense it into a liquid. Crude oil contains several components, or hydrocarbon compounds (also called "cuts" or "fractions"), with different boiling points. As crude oil is heated to higher temperatures, the lighter compounds boil first and successively heavier and heavier compounds then boil. The sequential boiling and condensation of these different components separates the various cuts of petroleum. Figure 20-2 shows a typical distillation curve for crude oil, with the lighter compounds boiling at lower temperatures. Crudes from different sources have somewhat different distillation curves, that is, somewhat different fractions of the various components.

Although there are many processes that are ancillary to the basic distillation process in a refinery (such as cracking, polymerization, and reforming), some of which increase the output of the lighter products, mainly gasoline, and increase the octane of gasoline, the main process in a refinery is distillation.

TABLE 20–2

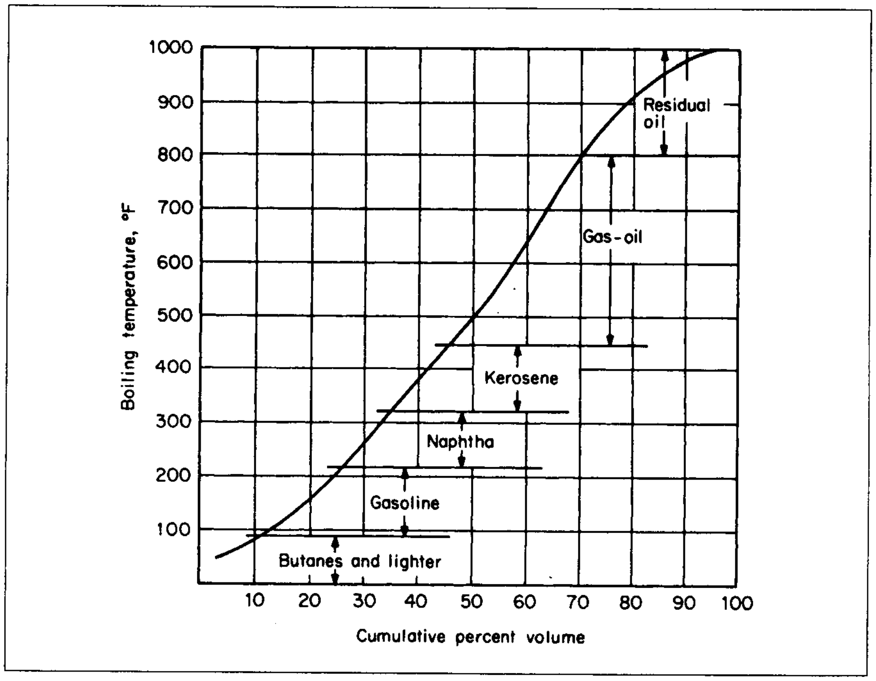
Organization of Petroleum Exporting Countries (OPEC)

Country	Date Joined	Current Quota, thousand b/d	Crude Oil Production thousand b/d	Energy Minister
Algeria	1969	750	850	Youcef Yousfi
Indonesia	1962	1,330	1,400	Gen. Ida Bagus Sudjana
Iran	1960	3,600	3,600	Gholamreza Aghazadeh
Iraq	1960	1,200	1,320	Lt. Gen. Amir Muhammed Rashid
Kuwait	1960	2,000	2,027	Issa Mohammed al-Mazidi
Libya	1962	1,390	1,450	Abdullah Salim al-Badri
Nigeria	1971	1,865	2,170	Dan Etete
Qatar	1961	378	570	Shiek Abdullah bin Hamad al-Attiya
Saudi Arabia	1960	8,000	8,548	Ali bin Ibrahim al-Naimi
United Arab Emirates	1967	2,161	2,130	Obeid bin Saif al-Nasiri
Venezuela	1960	2,359	3,200	Erwin Jose Arrieta Valera
Total		25,033	27,265	Secretary General Rilwanu Lukman

Source: U.S. Department of Energy.

FIGURE 20-2

Crude-oil distillation curve and its fractions.
[William L. Leffler, *Petroleum Refining for the Non-Technical Person* (Tulsa, Okla.: Pennwell Publ. Co., 1979), p. 7.]



DEMAND

This section discusses the demand for and uses of petroleum and some of its major products which are or may be the basis for futures contracts.

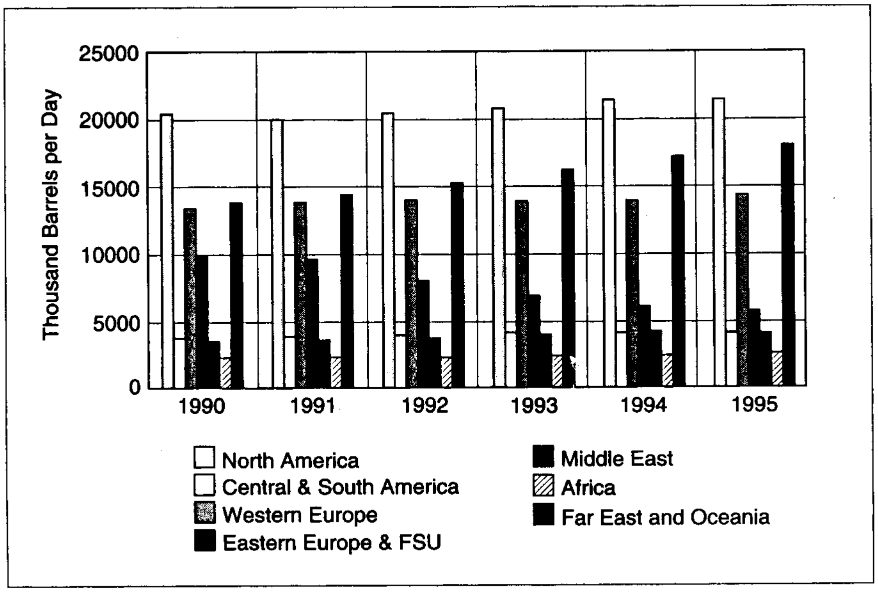
World oil consumption is shown as Table 20-3. The United States continues to lead the world in energy expenditure by a wide margin. The biggest increases in usage continue to originate from the developing nations, including China, South Korea, and India.

Crude Oil

Crude oil, as extracted from the earth, varies considerably by location. Crude oil is categorized and evaluated according to three characteristics. The first is sulfur content, which is important because sulfur is a pollutant. Low-sulfur crude oil (called "sweet") contains less than 0.5 percent sulfur by weight;

TABLE 20-3

World Petroleum Consumption



Source: Energy Information Administration.

high-sulfur crude ("sour") contains more than 1 percent sulfur by weight; and intermediate-sulfur crude has a sulfur content between 0.5 percent and 1.0 percent. This characteristic of crude oil has become more important in recent years as worldwide pollution control standards have become stricter.

The second characteristic is density. Low-density, or "light," crude oil is desirable because it yields more higher-value light products, such as gasoline, jet fuel, and light-distillate fuel oil. Density is measured in terms of API (American Petroleum Institute) gravity: light crudes have high API gravities (greater than 35°), and heavy crudes have low API gravities (less than 24°). The third characteristic of crude is field of origin, which is important because it summarizes many other characteristics, such as viscosity, pour point, color, flash and fine points, and metals content.

The demand for crude oil comes almost exclusively from refineries. In addition to the continuing long-term agreements and the growing spot markets in the distribution of crude oil, there are a large number of swap transactions whereby refiners or other purchasers of crude oil swap crude of different grades for different delivery points (location swaps) or for delivery at different times (time swaps). Swaps by grade may be necessary because different refineries do not refine efficiently all types of crude; they refine only a limited range of types of crude. In addition, shifts in demand for the various crude products (for example, toward heating oil and away from gasoline) cause refiners to swap for different grades of crude, but again only within the technological restrictions of the refinery. Time swaps permit refiners to vary the time at which they take delivery of crudes so that they can accelerate or decelerate refining.

Heating Oil

Heating oil is part of a family of petroleum products called *distillates*. These products, which are refined at approximately 350 to 800°F, represent the middle range of refinery products. Distillates are divided into two groups: No. 1 oil and No. 2 oil. (A third group, No. 4 oil, is sometimes added, but insignificant amounts of this product are produced.) No. 1 oil includes kerosene, which is used for burning in stoves and lamps (jet fuel also has a similar boiling range).

No. 2 oil represents about 85 percent of the distillate group and about 17 percent of a typical barrel of crude oil. No. 2 oil is also known as "heating oil," more commonly known as "gas oil" in Europe. Diesel fuel is very close to heating oil, but while most diesel fuel can be burned as heating oil, the opposite is not true. No. 2 fuel oil is commonly used for domestic and small commercial heating. Its most important characteristics are its burning characteristics and its sulfur content.

Given the use of No. 2 oil, the demand for and, thus, the stock of heating oil are seasonal. Since the demand for heating oil is greatest in the winter, heating oil stocks are greatest in October and November, at the start of the heating season, and reach a minimum during February and March, when the demand for heating oil is coming to an end. June and July are the beginning of the summer-fill period.

As a source of heat, heating oil competes with electricity and natural gas and, to a lesser extent, with coal and liquefied petroleum gas (LPG). During the last decade, heating oil has lost a significant share of the home heating market to electricity. Even within the seasonal demand for heating oil, the demand for and often the price of heating oil increase as the temperature drops. Due to weather differences, the demand for heating oil is also regional.

Unleaded Gasoline

Gasoline accounts for the largest proportion of refinery output. In fact, many of the recent technological advances in refinery processes have been made to increase the quantity and quality of the gasoline output. Gasoline is used almost entirely for transportation, mainly by passenger cars.

The demand for gasoline is also seasonal, being greatest during the summer driving months. Thus, gasoline stocks peak in April through May and trough in September through October. This seasonal effect is, thus, almost the opposite of the seasonal effect for heating oil. The complementarity in the demands for heating oil and gasoline permits the more efficient use of refineries and storage facilities.

The two most important characteristics of gasoline are vapor pressure and octane. Vapor pressure is the surface pressure it takes to keep the liquid from turning to a vapor or gas, and it must be high enough to permit the car to start, particularly in cold weather, and low enough so that the gas does not vaporize too easily. Octane is a measure of the "engine knock" the gasoline produces—the higher the octane, the less the knock. While lead can be added to raise the octane level and reduce knock, refineries must now use other techniques.

Natural Gas

Natural gas plays a major role in the U.S. energy profile, where it accounts for almost a quarter of total energy consumption. The market share of natural gas is likely to expand because of the favorable competitive position of gas in relation to other fuels and the tightening environmental standards for fuel combustion. Industrial users and electric utilities account for about 60 percent of the market; commercial and residential users make up the balance of demand.

The natural gas industry has gone through a metamorphosis since the enactment of the Natural Gas Policy Act of 1978, changing from an almost totally regulated industry to one that today largely operates as a free market.[3] The natural gas futures contract, launched in April 1990, is the fastest growing contract in the history of the New York Mercantile Exchange.

Salient production and consumption statistics for natural gas are shown as Tables 20-4 and 20-5.

Liquefied Propane Gas—LPG

Propane is a by-product of natural gas processing and oil refining. Domestic demand is about 1 million barrels per day, roughly one-third that of natural gas.

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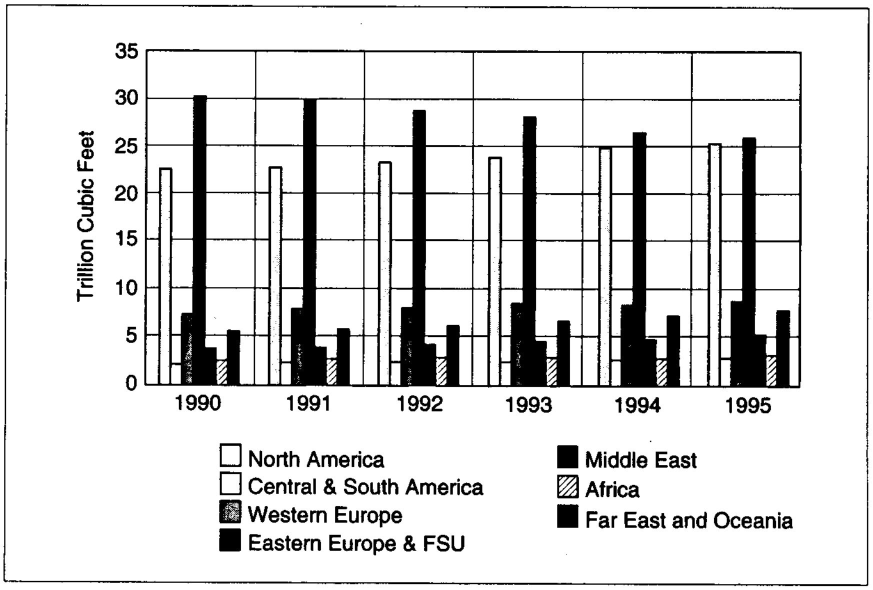
[3] New York Mercantile Exchange.

TABLE 20-4

World Dry Natural Gas Production.



Source: Energy Information Administration.

Propane is characterized by its diversity of uses: from residential cooking to crop drying to space heating in homes and industry. One of its largest markets is as a feedstock for the production of petrochemicals, such as benzene, propylene, phenol, and acetone. Natural gas utilities often store propane for use during periods of peak demand.

Other Refinery Products

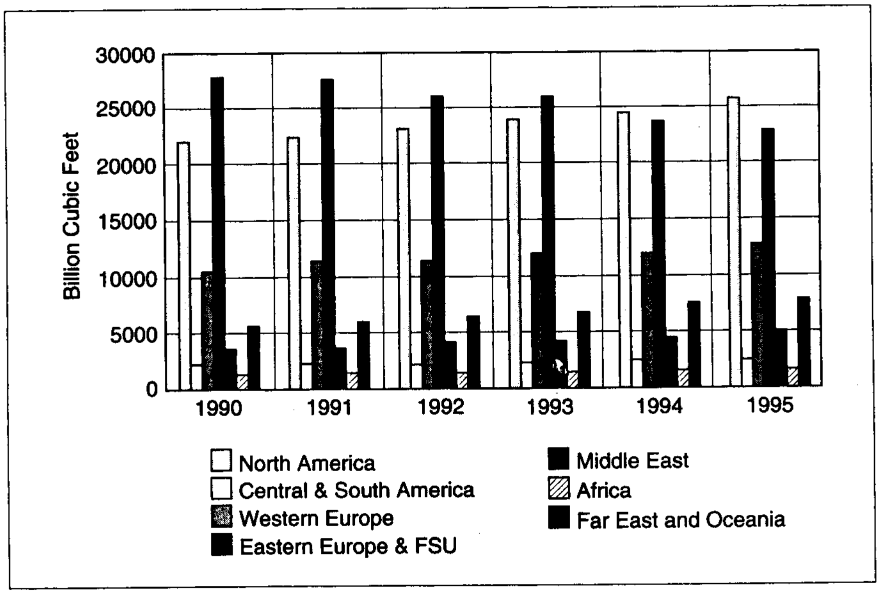
The crude oil and refinery products mentioned above are all the basis for current futures contracts. There are, in addition, other refinery products, such as the ones discussed briefly below.

Kerosene and Jet Fuel While these two products have similar boiling points, kerosene is used for burning in stoves and lamps and has few quality restrictions, while jet fuel must meet rigid quality restrictions.

Residual Fuel Oil The three types of residual fuel oil are referred to as No. 5 and No. 6 heating oils and Bunker C fuel oil. They are typically used

TABLE 20-5

World Dry Natural Gas Consumption



Source: Energy Information Administration.

to provide steam and heat for large buildings and for industry, including the production of electricity, and to power ships.

PRICE DETERMINANTS

During recent years, the factors that determine the price of petroleum and petroleum products have been widely and publicly discussed. These factors can, as usual, be summarized by supply and demand.

Supply, it has been learned, depends not only on the level of crude available but also on the way in which the crude oil is sold and distributed. The OPEC cartel has both limited the available amount of crude supplied and increased its price. These actions have induced a reduction in demand for many crude products, mainly gasoline; the lower demand is due to normal market responses and also to public policies in the consuming nations. The balance between supply and demand and the related strength or weakness of the OPEC oil cartel have been major determinants of the level of supply and the price of crude oil. These factors are a combination of government policies and market economics.

Factors which disrupt the supply channels, such as wars and blockages, also affect the supply. Weather is an important determinant of demand, particularly for heating oil in cold climates, but also for gasoline in the summer.

The balance of supply and demand in the various links in the production chain is also important. The amount of crude in transit via ships, the amount of products in storage in pipelines or tanks, and how close to capacity refineries are operating and with what mix of products are all important indicators of the supply-demand balance and prospective price changes for specific petroleum products.

FUTURES CONTRACTS

Futures contracts on the petroleum complex began on November 14, 1978, when the New York Mercantile Exchange introduced a futures contract on heating oil No. 2. From this beginning, petroleum futures have grown in number and trading volume and have become an important part of the futures industry and the petroleum industry. There are now futures contracts on several other petroleum-related products. Several exchanges, however, have listed several petroleum futures contracts since 1978 which have not succeeded. Table 20-6 summarizes the futures contracts based on petroleum and petroleum products that are considered active. Detailed specifications are provided in Chapter 3.

There is a futures contract based on crude oil for delivery in Cushing, Oklahoma. It was listed on March 30, 1983, by the New York Mercantile Exchange (NYME). Despite its recent listing, the crude oil futures contract has been the tenth most active futures contract in terms of trading volume. The crude oil futures contract is based on the delivery of light sweet oil. The following streams are deliverable:

Domestic

West Texas Intermediate
Mid-Continent Sweet
Low Sweet Mix
New Mexican Sweet
North Texas Sweet
Oklahoma Sweet
South Texas Sweet

Foreign

U.K. Brent Blend
Nigerian Brass Blend
Nigerian Bonny Light
Norwegian Ekofisk
Tunisian Zarzaitine/El Borma
Algerian Saharan Blend

TABLE 20-6

Petroleum Futures Contracts*

Underlying Product*	Date Listed and Exchange	Trading Volume (January–September 1984)	Price Basis	Unit of Trading	Minimum Price Fluctuations	Contract Months
Heating oil No. 2	1978 New York Mercantile Exchange	1,464,420	FOB seller's exshore facility in New York Harbor	1000 barrels (42,000 gallons)	0.01 cent per gallon ($4.20 per contract)	All calendar months, up to 18 months
Gasoline (leaded)	1981 New York Mercantile Exchange	571,317	FOB seller's exshore facility in New York Harbor	1000 barrels (42,000 gallons)	0.01 cent per gallon ($4.20 per contract)	All calendar months, up to 18 months
Crude oil	1983 New York Mercantile Exchange	1,204,600	FOB buyer's designated pipeline storage facility in Cushing, Oklahoma	1000 barrels (42,000 gallons)	$0.01 per barrel ($10 per contract)	All calendar months, up to 18 months
Gasoline (unleaded)	1984 New York Mercantile Exchange		FOB seller's exshore facility in NewYork Harbor (other options also available)	1000 barrels (42,000 gallons)	0.01 cent per gallon ($4.20 per contract)	All calendar months, up to 15 months
Propane (LPG)	1981 (reintroduced in 1981 after original introduction in 1971) Petroleum Associates (New York Cotton Exchange)	16,238	FOB licensed facilities in Mont Belvieu, Texas, or Conway, Kansas	1000 barrels (42,000 gallons)	0.01 cents per gallon ($4.20 per contract)	All contract months, up to 12 months
Gas oil	International Petroleum Exchange (IPG)—London	N.A.	FOB-approved facilities in Amsterdam, Rotterdam, or Antwerp	100 metric tons (735.7 barrels or 30,895 gallons)	$0.25 per metric ton ($25 per contract)	Nine consecutive calendar months, including the current month

*Detailed specifications are provided in Chapter 3.

Despite the fact that there are several deliverable grades, the crude oil futures contract tracks West Texas Intermediate (WTI) crude. Many of the other grades are not, in practice, delivered in Cushing. In addition to delivery according to the delivery specifications of the futures contracts, many contracts are settled by exchange for physicals (EFP); that is, through mutual agreement between the long and the short, the contract is settled by delivery of a nondeliverable grade at a nondelivery point or on a nondelivery day or at a nondelivery time of day at a mutually acceptable price.

The original NYME heating oil No. 2 contract is for delivery in New York Harbor. The NYME listed a contract on October 5, 1981, on leaded gasoline for New York Harbor delivery, and this contract has become quite active.

The International Petroleum Exchange (IPE) in London trades a gas-oil contract for Netherlands delivery. The gas-oil deliverable grade is similar to but somewhat lower than the heating oil No. 2 on the NYME futures contract. The New York Cotton Exchange, in 1981 (after an original unsuccessful introduction in 1971), listed a contract based on LPG.

The NYME listed a contract on unleaded gasoline on December 3, 1984. This contract has developed liquidity and, as indicated above, is becoming increasingly useful as more automobiles use unleaded gasoline.

The futures price relationships of petroleum futures contracts—that is, the relationships between the prices of the various contract months—are due to a combination of several phenomena. Petroleum and its products are storable, so it may seem that their futures contracts would be priced like the contracts of other storables, such as metals; that is, futures prices would increase the longer it takes to reach the maturity of the futures contracts.

As indicated above, there is a seasonal aspect to both gasoline and heating oil which provides a seasonal component for their pricing. The summer months are the time of peak demand for gasoline and the winter months for heating oil. This provides a seasonal aspect for gasoline and heating oil pricing, as there is for the pricing of grains.

Finally, the strength of the demand for the products affects the price relationships. Since these products can be stored in their means of transportation, the strength of the demand for the products, both current and expected, can cause changes in the price relationships. Typically, when the demand is weak, the prices of deferred futures contracts tend to be lower. These different factors make the pricing of these petroleum-related futures contracts quite complex.

The NYME heating oil and gasoline contracts refer to New York Harbor delivery. The prices, thus, reflect seasonal factors, such as the weather in the northeast United States, which may be different from weather in other parts of the country. Thus, basis relationships for hedges outside the northeast can be affected by such factors.

The petroleum business also tends to be regionalized—each region may have different demand characteristics. But because New York Harbor is linked to the Gulf Coast by pipeline, the basis between these two locations tends to be relatively stable. But basis changes can occur for locations away from these points.

Understanding these price relationships is critical for understanding the basis, which is defined as the futures price minus the cash price in these markets. And understanding the basis is critical to using these contracts for effective hedging. In defining the basis for a hedge, the reference location of the cash price must be specified.

Figures 20-3 through 20-6 shows recent price histories for crude oil, heating oil, unleaded gasoline, and natural gas.

SPECULATIVE USES

Obviously, the petroleum-related futures contracts can be used for hedging by participants in the markets for petroleum and petroleum products. Examples of hedge uses are as follows:

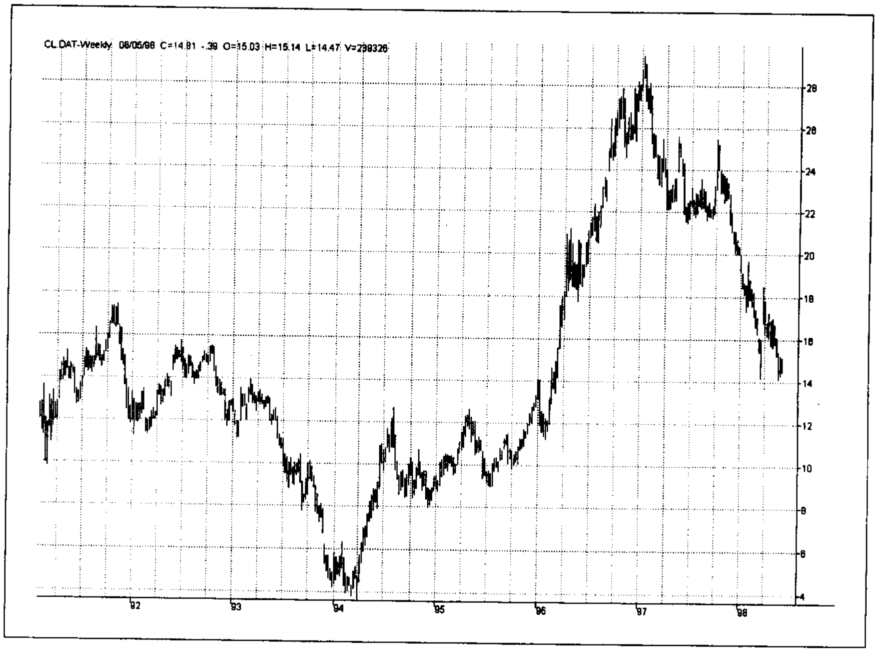
- An oil-trading company, to hedge the forward purchase of crude oil, sells crude oil futures contracts.
- A refiner, to hedge an inventory of gasoline from refinery output, sells gasoline futures contracts.
- A gasoline jobber, to hedge the forward sale of gasoline, buys gasoline futures contracts.

Another type of hedge, which can also be used as a strategy for speculation, is the so-called crack hedge, based on the crack spread. The crack hedge or spread is based on the price relationship between crude oil (a refinery input) and gasoline and heating oil (refinery outputs). The crack hedge or spread, thus, relates to the profit margin of the refinery and is called the *gross cracking margin*. To hedge or speculate on the basis of a crack spread, refinery ratios must be specified. While the ratio of 3 barrels of crude oil to produce 2 barrels of gasoline and 1 barrel of heating oil is often used, for simplicity assume that 2 barrels of crude produce 1 barrel of gasoline and 1 barrel of heating oil.

Although all three of these futures contracts are in terms of 1000 bar-

FIGURE 20-3

Crude oil futures (weekly), 1990–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



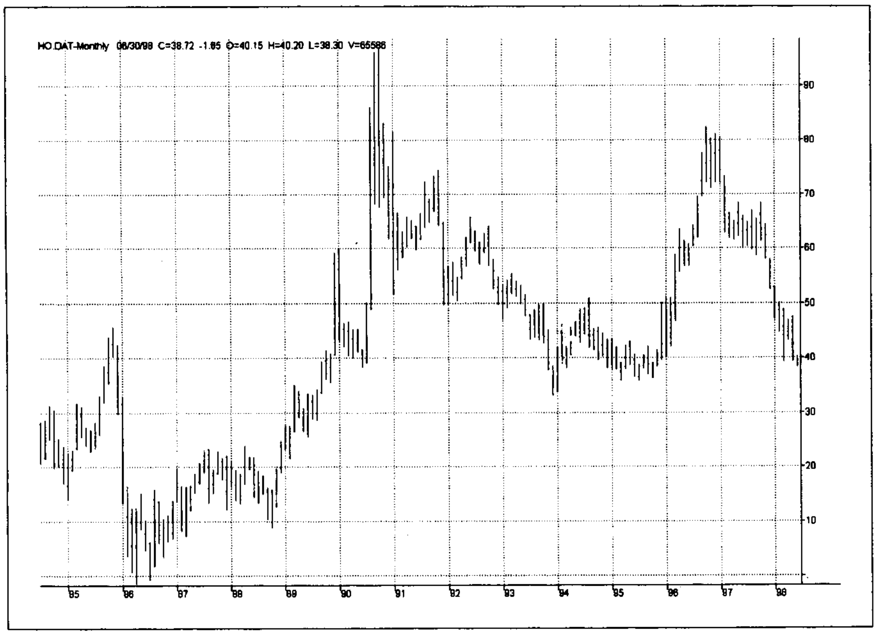
rels (42,000 gallons), the crude contract is priced in terms of dollars per barrel and the gasoline and heating oil contracts in terms of cents per gallon. To spread among these contracts, it is necessary to convert all three to common terms. A refiner-hedger or refiner-speculator who expected crude prices to increase relative to gasoline and heating oil prices would "sell the crack," that is, buy two crude oil futures contracts and sell one gasoline futures contract and one heating oil futures contract.

Futures contracts on petroleum and petroleum products have provided speculative opportunities on products which, since the 1970s, have exhibited considerable price volatility and have been continuously in the national and international headlines. The most obvious way to speculate in these contracts is to buy or sell one of these futures contracts on the basis of national and international political and economic factors such as the following:

- OPEC strengthening or fragmenting. (Crude oil prices are most sensitive to the solidarity of OPEC.)

FIGURE 20–4

Heating oil futures (monthly), 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



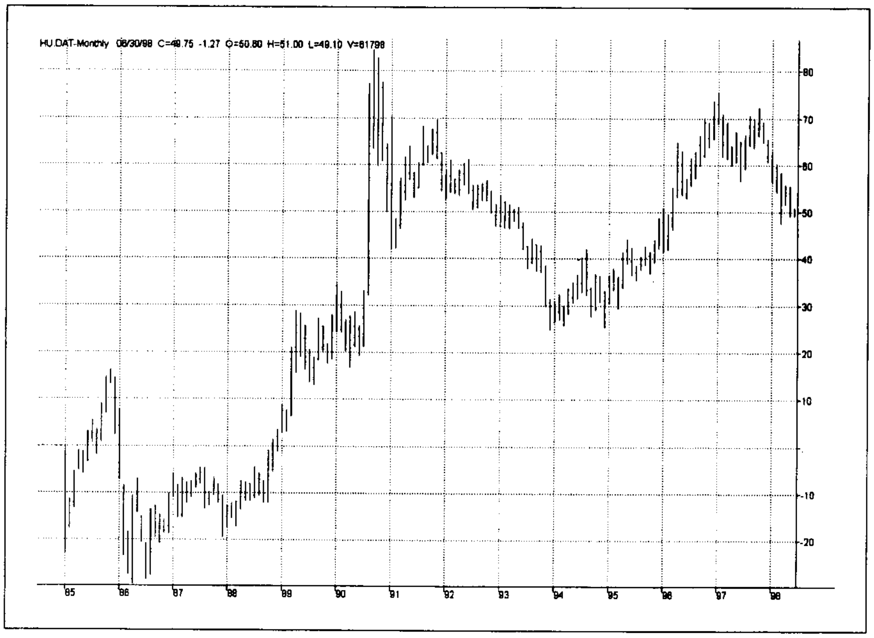
- Announcements of petroleum stockpiles.
- The discovery of new oil sources.
- Unseasonally warm or cold weather.
- Energy conservation efforts succeeding or failing.
- Strong or weak seasonals in demand.

Intercontract spreads can also be done to take advantage of relative price changes—for example, between crude oil and gasoline, crude oil and heating oil, or gasoline and heating oil. The latter may be interesting in view of the different seasonals for these products.

Intracontract spreads—that is, buying one month and selling another month of the same futures contract—are appropriate ways to speculate on the basis of the seasonals in gasoline and heating oil. As indicated, the gasoline season goes from May to September, while the heating oil season goes from October through April. As a result, gasoline futures prices for June and July delivery tend to begin rising in March, and heating oil

FIGURE 20-5

Unleaded gas futures (monthly), 1986–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



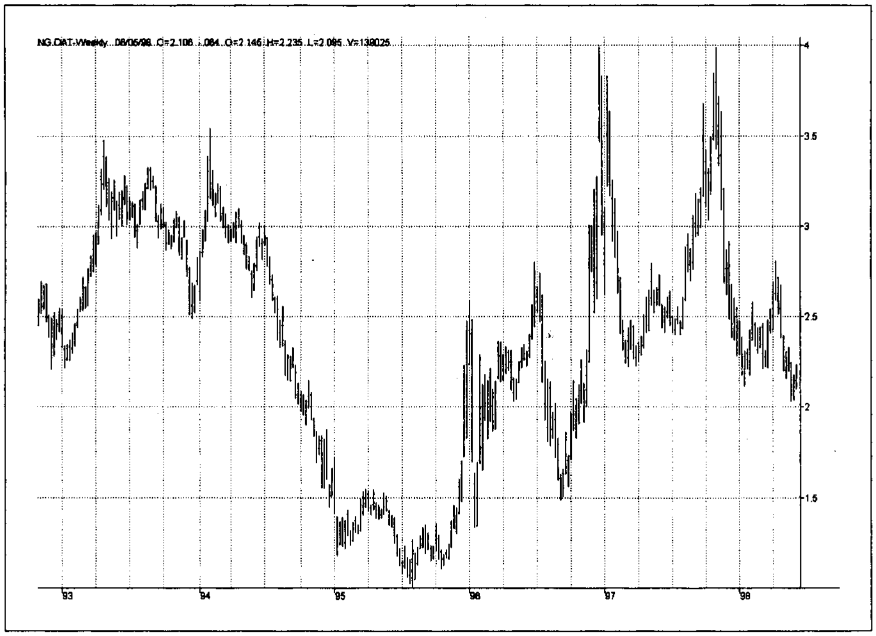
futures prices for December and January delivery tend to begin rising in September or October. Intracontract spreads based on these seasonals are common. Of course, while these trends are typical, changes in weather patterns or consumption patterns may alter them.

More sophisticated speculators can also engage in arbitrage, which can be regarded as a more sophisticated form of spreading. One form of arbitrage is between New York heating oil and London gas oil. Although the contracts are similar, the NYME specifications are for a somewhat higher grade, and the NYME contract is worth about 2 cents more per gallon than the IPE contract. Although both contracts are quoted in terms of U.S. dollars, adjustment is necessary because the IPE contract is for 100 metric tons, while the NYME contract is for 42,000 gallons. The conversion is that 100 metric tons equals 30,954 U.S. gallons. Another complicated form of arbitrage is the crack spread mentioned above, which is a more sophisticated intercontract spread.

The petroleum futures complex, which began in 1978 and has grown

FIGURE 20-6

Natural gas futures (weekly), 1992–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



and broadened significantly, has become an important futures group for hedgers and speculators. Its growth, broadening, and importance are likely to continue to increase.

Notes from a Trader

Crude oil is one of the most actively traded commodities in the world, and the crude oil futures contract reflects this huge cash market. Crude oil futures traders follow international oil politics, particularly those related to OPEC, and watch for possible disruptions in the supply chain due to wars, strikes, or other stoppages. Inventory levels, both in transit and in storage, are also watched as a basis for trading. Weather also affects the prices of petroleum products; in particular, warm or cold weather in the United States or Europe has an effect on heating oil prices.

Basis risk can also add to the risk of speculation in these markets. For example, there may be, at times, a considerable difference in the price changes of, for example, North Sea Brent crude oil and West Texas Intermediate (WTI) crude, on which the pricing of the futures contract is based, and there may be a significant difference between the New York Harbor delivery and the Cushing, Oklahoma, delivery, which is the basis for the futures contract.

A frequent aspect of these markets, particularly the market for crude oil, is their backwardation, that is, the contract price being lower the more distant the contract month, even though these markets are negative carry markets. For this reason, buyers in these markets may want to use the deferred contracts.

Both fundamental and technical methods are used in these markets. The crude oil futures contract has a minimum price movement, or "tic," of $10, or 1 cent per barrel, while the products have a value of $21 per contract, or 5 cents per barrel. The liquidity of these futures markets, particularly for crude oil and heating oil, is considerable.

APPENDIX

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Associations

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Gas Processors Association, Tulsa, OK
Gas Research Institute, Chicago, IL
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21 CHAPTER

The Food, Fiber, and Wood Products Markets

"Cotton is planted in the spring, mortgaged in the summer, and left in the fields in the winter."

This chapter presents an in-depth analysis of five internationally traded commodities—coffee, sugar, cocoa, cotton, frozen concentrated orange juice, and wood products (random length lumber and oriented strand board). Four other markets which will be examined briefly are butter, cheddar cheese, milk, and shrimp.

COFFEE

Introduction

Coffee was probably first used by the Ethiopians during ancient times. Its use apparently spread from Ethiopia to various Arabian countries, Egypt, and Turkey in the early 1600s and into Europe by way of Italy. In the 1600s, coffee was the main nonalcoholic drink of Europe and the Americas, with the exception of Great Britain and its possessions, which switched to tea. Coffeehouses were common in the United States quite early in the country's history, and coffee consumption in the United States quickly exceeded that of the coffee-producing countries.

As the demand for coffee in the United States and other western countries continued to grow prior to World War II, the supply continued to come almost exclusively from South and Central America, mainly Brazil. Since World War II, however, African countries have also become major producers.

The internal policies of the governments of producing countries with regard to the number of trees planted, price support programs, and world export quotas have also impacted the amount of coffee available for world trade. For instance, the collapse of an international agreement among the majority of coffee producers and exporters in the summer of 1989 was followed by a period of extreme price volatility.

Currently, coffee is the most active internationally traded beverage, with substantially greater trading activity than tea and cocoa. Coffee is one of the most active internationally traded commodities overall, considering even grains and other raw materials. A major reason for the active international trade is that coffee production, like that of tea and cocoa, is concentrated in the tropical and subtropical areas of the world, while consumption is in the United States, other parts of North America, and Europe.

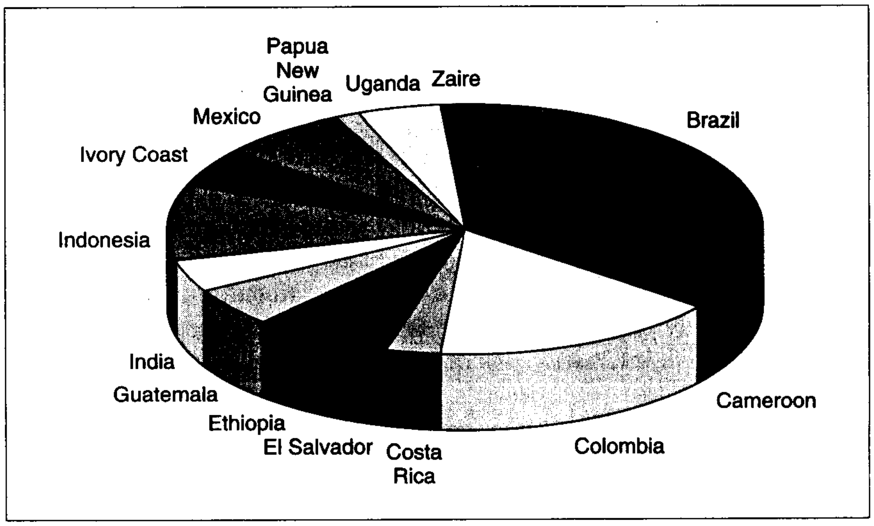
Supply

There are two general types of coffee. The first is arabica, which is a very popular, mild coffee produced mainly in Brazil, Colombia, and other Latin American countries. As a result, arabicas are often subdivided into Brazilians, Colombians, and other mild coffees. The second type of coffee is the robusta, grown mainly in Africa, on a hardier plant than arabicas. Because robustas do not have the flavor of arabicas, robustas are used mainly in lower-quality blends and instant coffee.

As shown in Table 21-1, Brazil is the dominant coffee producer in the world. While Brazil now produces approximately 25 percent of the world's total, as recently as the 1930s Brazil produced approximately 60 percent of the world's coffee. Colombia is the world's second largest producer of coffee, producing significantly more than any other country, except Brazil. Brazil and Colombia produce arabicas. Mexico, El Salvador, Guatemala, and other South and Central American countries are also important producers of arabicas. Virtually all robustas are grown in Africa, with the Ivory Coast being the major robusta producer, followed by

TABLE 21-1

World Green Coffee (total) Production



Source: U.S. Department of Agriculture.

Uganda. However, approximately one-fourth of Africa's total production is of arabica, mainly in Ethiopia and Kenya. In terms of price and quality, Colombian milds are usually followed, in order, by other milds, unwashed arabicas, and robustas.

In general, arabicas are grown in altitudes over 2000 feet with moderate and uniform temperatures. Robustas are grown at elevations of 500 to 2000 feet and are fairly resistant to disease. In order for coffee to be grown on an important commercial scale, the trees must have intense sunlight, rich soil, and warm rains. Coffee thrives in most tropical and subtropical areas. A botanical oddity is that the best coffees grow in areas in which the coffee plant does not grow wild. It is interesting to note also that coffee does not grow in or around Mocha.

The supply of coffee, like that of any other crop, depends to a considerable degree on natural conditions, although the range of conditions adequate for satisfactory coffee production is wide. The trees require at least 40 inches of rain each year, and the berries require considerable moisture before they mature. Dry weather is preferable during the harvest. Temperatures should be in the high 60s, although somewhat warmer temperatures are tolerable. Frost and wind, however, are mortal enemies of the coffee tree. Although many types of soil are acceptable, the difference in the quality of the coffee produced due to the nature of the soil may be quite material. It is widely believed that coffee grown in locations shaded from the full heat of the sun is superior. Coffee, of course, is also affected by diseases, insects, and fungi. In addition, wars have affected prices considerably because so much of what is grown must be shipped long distances to consuming countries.

Most of the world's coffee comes from a tree known as the Arabica, which apparently originated in Ethiopia but now grows in most coffee-producing regions. The trees produce small white flowers which fall off the trees and are soon replaced by small clusters of cherries that grow along the limbs of the trees for a period of 6 or 7 months. They change in color as they mature from green to deep red. Arabica trees take about 5 years to mature enough to bear fruit, unlike the robusta variety, which requires only 2 or 3 years. Robustas, which have become commercially important only during about the last 75 years, are popular among producers partly because of their rapid growth to maturity and their resistance to disease. They have succeeded, however, in capturing only a relatively small amount of the world's consumption because of the less popular aroma and flavor of the coffee produced from them.

Most coffee trees produce the first full crop in about their fifth year. Each tree produces about 1 pound of marketable coffee each year until it is 25 or 30 years old, although some are productive much longer. The beans ripen at various times in different countries and are harvested, usually by hand, over a period of 4 to 6 weeks. The cherries, which are picked, consist of a sweet pulpy fruit usually covering two flat beans. There are two principal methods of preparing green coffee beans for the market. The first is the so-called wet method. With the wet method, after the outer pulp is mechanically removed from the berries, the berries are washed and put into tanks for fermentation, which affects both the flavor and the color of the coffee. The berries are washed again, then dried to remove the inner skin. It is surprising that no commercial use has yet been discovered for the pulp, despite long efforts to find one. Areas that do not have adequate water and that have long periods of hot, dry weather use the natural method, or dry method, of drying the berries in the sun. While the advantage of this process is that berries can be separated according to their readiness, its effectiveness depends on the constancy of the weather. The wet method, used for most of the higher-priced mild coffees, produces higher prices than the dry, or natural, method.

The producing countries also perform two other functions before shipping the beans. One is classification by size and the other is grading. When these steps have been completed, the coffee is packed in heavy bags for storage or shipment to market. Green coffee can be stored for long periods with little change in quality.

Coffee is then blended, roasted, and packaged for sale to the consumer. The blending and roasting are necessary because green coffees are not homogeneous products. Blending, as indicated, is a highly skilled, secret process for getting the best possible combination of aroma, flavor, appearance, and price. It is done in order to encourage maximum market demand, unify the characteristics of the different components, and allow a favorable dollar return to the seller.

Because there are different harvest periods for coffee in different parts of the world, coffee is harvested continuously throughout the year. Brazilian coffee is harvested from April to August. For this reason, and due to the variability of Brazilian weather, coffee prices are subject to weather shocks during June and July each year. Colombia harvests coffee from October through March. In Africa, the Ivory Coast harvest is from November through April.

In addition to the usual requirements such as proper soil, labor, adequate financing, and assured markets, coffee presents some special problems. The investment required is large. The trees are subject to a wide variety of highly destructive insects, fungi, and disease. Worst of all, the yield from even the best trees is very unpredictable. The crop from a given tree can vary by 10 times from its minimum to its maximum, and the tree can produce bumper crops for several years in a row and then have sparse yields for the next several years with no apparent pattern. With so much land available for coffee growing in countries that can produce coffee and the ever-growing demand for coffee, the probability of wide variations in supply, both long-term and short-term, is high.

The marketing process for coffee is relatively simple. After the green coffee leaves the producing country, it enters a marketing chain which ends with blenders, roasters, and distributors. Because coffee has essentially a single end use—as a beverage—its distribution pattern is well defined.

The export of green coffee is handled by a small number of firms, which deliver the coffee into jobbers' or roasters' warehouses in a number of ports, among the most important of which are New York, New Orleans, San Francisco, Le Havre, and Antwerp.

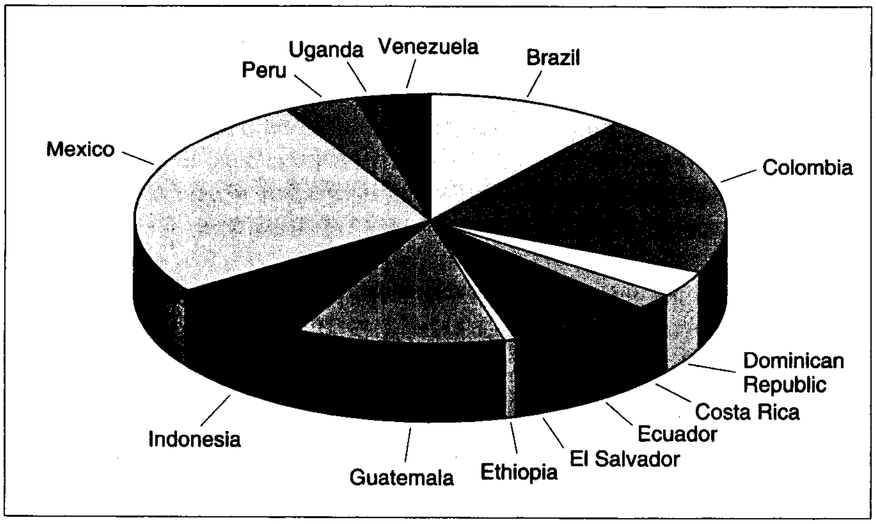
Demand

Coffee is extremely popular in many parts of the world. The United States is the world's largest importer of coffee, with Europe a close second. Table 21-2 shows the origin of U.S. coffee imports. Coffee is used almost exclusively as a beverage; less than 1 percent is used for other purposes, such as flavoring, candies, and desserts. Coffee is not consumed because of its capacity to quench thirst, nor does it have any nutritive value. Rather, the popularity of coffee, like that of tea, which has the same characteristics, is due to its being a stimulant as a result of its caffeine. Table 21-3 shows world coffee supply and distribution figures from 1990 to 1995.

Unlike its supply, the demand for coffee varies little over time and responds only to a small degree even to reasonable changes in price or purchasing power, mainly because coffee has only one purpose, has no substitute acceptable to most of its consumers, and is regarded as a necessity by most of them. In addition, a stabilizing effect on price results from the fact that green coffee is storable at a relatively low cost for long periods, which evens out, to some degree, the effects of occasional significant

TABLE 21-2

Origin of Green Coffee Imports into the United States



Source: Bureau of Census, U.S. Department of Commerce.

TABLE 21–3

World Coffee Supply and Distribution, thousands of 60-kilogram bags (132.276 lbs per bag)

Crop Year	Beginning Stocks	Production	Imports	Supply	Total Exports	Bean Exports	Rst/Gm Exports	Soluble Exports	Domestic Use	Ending Stocks
1982–3	43,842	81,904	733	126,479	66,059	63,344	220	2,495	20,450	40,199
1983–4	40,199	88,801	606	129,606	68,191	65,069	351	2,771	20,897	40,838
1984–5	40,838	90,362	456	131,656	72,322	68,675	306	3,341	22,828	37,366
1985–6	37,366	95,750	397	133,513	70,478	67,724	248	2,506	21,250	41,815
1986–7	41,815	79,394	262	121,471	66,982	64,351	298	2,333	21,372	33,287
1987–8	33,287	103,170	296	136,753	67,504	64,838	337	2,329	21,275	48,174
1988–9	48,174	94,165	415	142,754	71,371	68,108	162	3,101	21,280	50,193
1989–90	50,193	96,958	258	147,409	83,402	80,034	129	3,239	21,065	43,012
1990–1	43,012	100,181	352	143,545	76,319	73,434	83	2,802	22,489	44,997
1991–2	44,997	103,731	349	149,077	81,387	78,341	53	2,993	22,198	45,492
1992–3	45,492	92,888	770	139,150	77,772	73,615	113	4,044	21,650	39,728
1993–4	39,728	93,303	1,002	134,033	77,332	72,610	108	4,614	23,340	33,361
1994–5[*]	33,361	98,178	987	132,526	69,957	65,460	228	4,269	22,931	39,638
1995–6[†]	39,638	89,907	705	130,250	74,338	69,508	209	4,621	24,203	31,709
1996–7[‡]	31,709	100,923	651	133,283	79,573	74,937	175	4,461	24,958	28,752

[*] Preliminary.

[†] Estimate.

[‡] Forecast.

Source: Foreign Agricultural Service, U.S. Department of Agriculture.

changes in supply. This short-term, highly inelastic demand for coffee, coupled with great changes in supply, has led over many years to attempts to control the supply and marketing of crops, the burning of supplies, and demands for subsidies to growers and exporters by producing countries.

Green coffee beans are used to produce both regular coffee and instant coffee. Both regular and instant coffees are typically blends of several types of coffees. While all coffee blends are different and their composition is regarded as proprietary, a typical regular blend for U.S. consumption is composed of a mixture of Colombian or Central American milds and Brazilians, with the grade of the blend increasing as the portion of the other milds increases and the portion of the Brazilians decreases. The goal of blenders is to vary the ingredients of the blend in response to the availability of the various coffees at a low cost but retain the same flavor. This flexibility is necessary because, with the possible exceptions of Brazilian and Colombian beans, no other sources are sufficiently large to be able to guarantee adequate supplies every year.

The use of robustas has increased in recent years for two reasons. First, robustas have been increasingly used in regular coffee despite their lower quality. Second, the use of instant coffee (solubles) has increased, and although instant coffees are also blends, robustas are the main component. The use of instant coffee has increased, particularly internationally, due to its convenience and also because the quality of instant coffee has improved.

Due to the principal use of coffee as a beverage, the short-run demand for coffee is fairly inelastic in response to both price and income changes. However, long-run trends have affected the demand for coffee. Over the last two to three decades, the demand for coffee in the United States has declined, as measured both by the percentage of the population consuming coffee and by per capita consumption. This decline has been due to an aversion to caffeine as a result of increased health consciousness and to an increased use of soft drinks, particularly by the young, who then continue to consume more soft drinks as they become older. However, in other countries (particularly Japan, Eastern Europe, and parts of the former British Empire which have shifted from tea) the demand for both regular and instant coffees has grown sufficiently to offset the decline in the United States.

Price Determinants

The price of coffee depends on both supply and demand. However, because, as indicated above, the demand for coffee is fairly stable, the sup-

ply is the major determinant of short-run changes in the price of coffee. And weather is the major determinant of short-run changes in supply. The months of June and July are the freeze-scare months in Brazil and other South American producing countries. This Brazilian frost period is the main uncertainty affecting coffee prices.

One of the most extraordinary price rises in the history of any commodity occurred in early 1954, when the price rose very quickly to more than 95 cents a pound in the spot and futures markets and more than $1.35 at the retail level. Starting on the night of July 5, 1953, huge blasts of frigid air swept over the entire southern regions of South America, and the coffee-growing areas of Brazil were enveloped in freezing weather for 2 days and 3 nights. Because damage to coffee trees from cold is not immediately apparent, the scope of the disaster was not at first readily understood. By September and October, however, it was becoming obvious that what had happened was one of the greatest calamities ever to strike a crop. According to Brazilian coffee officials, more than 904 million coffee trees were destroyed or damaged. The result was a huge speculation in both cash and futures. Panicked consumers stood in line to buy coffee at ever-increasing prices, while those who had coffee to sell withheld it, anticipating even higher prices.

While weather is the most important factor which influences the supply and price of western hemisphere coffees, insects are the major problem with eastern hemisphere production.

Actual or potential dock strikes may also affect coffee prices by initially causing a buildup of inventories and later either a shortage if the strike materializes or a need to liquidate excesses if the strike does not materialize. Wars and potential instability may affect the transport of coffee and its price.

Green coffee can be stored for a long time period under the right conditions. And because coffee is grown in countries with moderate temperatures and humidities, conditions permit storage in most producing countries. Thus, coffee can be stored in producing as well as consuming countries. Stored stocks tend to mitigate the price swings caused by the combination of price-inelastic demand and weather-induced supply changes. The level of inventories of green coffee in producing or consuming countries is an important determinant of coffee prices.

The marketing policies of major coffee-producing countries are also major determinants of coffee prices. In this regard, the role of Brazil, the world's dominant coffee producer, is pivotal. During the 1930s, as indicated, Brazil produced over 60 percent of the world's coffee. During this period, Brazil stored and even destroyed significant portions of its coffee

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production. While these policies did support high prices for Brazilian coffee in the short run, they also made possible the increased penetration of the coffee market by Colombia and other Central American and African countries.

Another aspect, in addition to size, of Brazil's coffee crop is also important. Unlike the crop in most Latin American countries whose temperature and rainfall are very regular, Brazil's crop is subject to both droughts and frosts. Brazilian weather conditions, thus, often cause significant price increases.

Futures Contracts

Coffee futures contracts began to be traded in the United States at the New York Coffee Exchange during 1882. Futures trading on sugar was added during 1916, and the exchange's name was changed to the New York Coffee and Sugar Exchange. It became the New York Coffee, Sugar and Cocoa (NYCSC) Exchange in 1979, when it merged with the New York Cocoa Exchange.

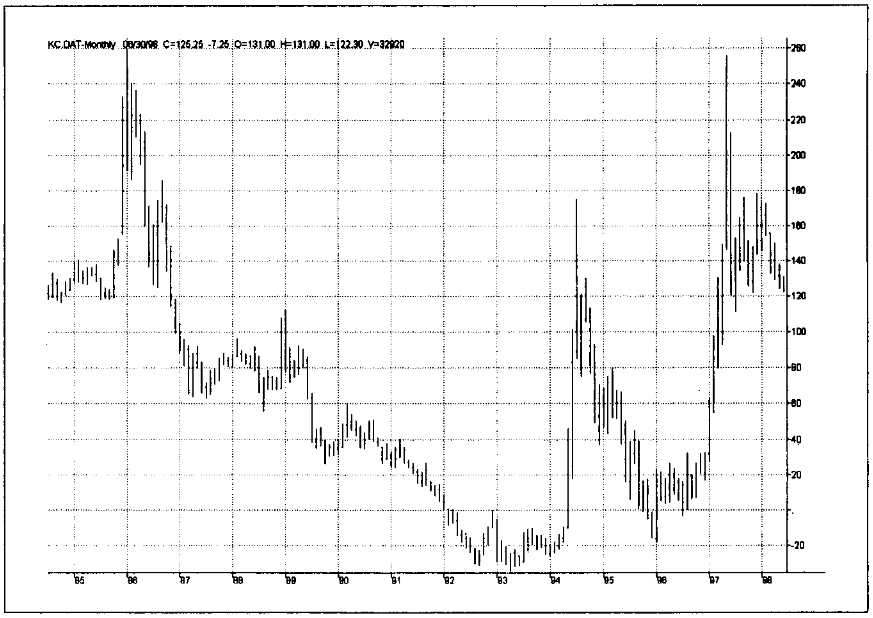
Two types of coffee futures contracts have been traded recently at the NYCSC Exchange: type C on arabica coffee from 19 countries, excluding Brazil, and type B on Brazilian coffee. Only the type C contract is currently traded at the NYCSC Exchange—the type B contract was formally suspended during 1982, after several years of inactivity. A type U futures contract (on robusta coffee) is traded in the London Coffee Terminal Market. The difference in the locations of these contracts reflects primarily their proximities to the locations of the underlying coffee—New York to South America and London to Africa. Between 1968 and 1970 the NYCSC Exchange also traded a type U (robusta) contract, and during the 1960s it also traded the other coffee contracts.

The NYCSC Exchange type C contract calls for the delivery of 37,500 pounds (approximately 250 bags) of washed arabica coffee from any of 19 countries, not including Brazil; coffee from several countries is deliverable either at par or at discounts ranging from 100 to 800 points (cents per pound), but only Colombian coffee is deliverable at a premium (200 points). Delivery is made at ports in New York and New Orleans. The trading months are March, May, July, September, and December. Prices are quoted in cents per pound, with a minimum price fluctuation of 1/100 cent per pound, or $3.75 per contract.

Figure 21-1 provides recent futures prices for the NYCSC Exchange type C contract.

FIGURE 21-1

Coffee futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



Speculative Uses

Due to the volatility of the prices of coffee futures contracts shown in Figure 21-1, speculators have been active simply buying or selling the contracts on the basis of the price determinants discussed above. A common speculation is based on the weather in Brazil. Even though Brazilian coffee is not deliverable on either contract, Brazil's supply is so large that bad weather in Brazil which reduces the size of the Brazilian crop affects all coffee prices.

Spreading between the NYCSC Exchange and London contracts on the basis of the belief that the arabica-robusta relationship is out of line is common, although the relationship between these two futures depends not only on relative coffee prices but also on the dollar-pound exchange rate. Intracontract spreads in coffee are less interesting than in many other commodities because coffee has no crop year.

The analysis of the prices of coffee futures is simpler than for most other commodities. The sources of supply and areas of demand are well defined. The United States is the prime consumer, and coffee demand is fairly stable regardless of price. The sources of volatility are on the supply side, but even these sources are easy to identify and include severe growing problems in Brazil or interference with shipping due to wars, long strikes, or other factors. These factors can affect coffee prices significantly because of the enormous influence on U.S. consumers, who have no domestic source of coffee except Hawaii, which produces only relatively small amounts. Because the coffee market is often fairly thin, the risk of long, unexpected changes in supply may cause extended violent price moves.

Sources of Information

The Foreign Agricultural Service of the USDA issues the circular *Coffee* on a quarterly basis (March, June, September, and December). This publication provides estimates of coffee production. The National Coffee Association also issues several statistical reports. The International Coffee Organization of London publishes *General Statistical Documents.* Finally, the New York Coffee, Sugar and Cocoa Exchange provides several sources of useful information.

Notes from a Trader—Coffee

For the fundamentalist, coffee analysis is simpler than the analysis of most other commodities. The sources of coffee and the locations of demand are well defined. The United States is the prime consumer of coffee, and there are few signs of any change in the consumption habits of coffee drinkers in this country. Despite the inroads made by soft drinks, most U.S. adults drink coffee regardless of price and with little consideration of current purchasing power. Warnings of hazards to health to date have affected consumption only in those who consume quite large amounts or those who have health problems such as heart trouble. The International Coffee Agreement, unlike most other such agreements, has a history of being effective.

The greatest potential hazard to a trader is the disruption of the sources of supply, but even these are easy to define. Such disruptions usually involve growing problems in Brazil, such as hot, dry weather during the late summer or early fall, and interference with shipping, such as a war or long strike. The effect of weather on coffee production in Brazil during the late summer and early fall is particularly important. Coffee trees usually flower several times before developing coffee beans. Droughts in

Brazil during September and October cause the trees to miss flowerings and prices to rise sharply. However, subsequent rain can then cause significant price decreases. Such factors can have a special influence on coffee prices because of the significant influence of U.S. consumers, who have no domestic source of supply except Hawaii, which produces only relatively small amounts. At times, even rumors about Brazilian weather and supply cause significant price changes. The main change in coffee patterns in the last several years has been that made by instant, or soluble, coffee, which is becoming more popular because of its simplicity of preparation despite its inadequacies in aroma and flavor.

The coffee market tends to be thin, and this condition, combined with the risk of large and unexpected supply changes, may cause extended violent moves. The coffee market is no place for the underfinanced or the timid. Inverted markets are frequent in coffee and, therefore, popular with those who like to buy discount contracts on the theory that the price level is probably understated and they will make money sooner or later.

SUGAR

Introduction

Sugar and other sweeteners have played an important role in U.S. history. Although Columbus brought sugarcane to the New World, the colonies depended primarily on molasses imports as a sweetener. The Sugar Act passed by the British in 1764, which imposed a tax on molasses imports, contributed to the beginning of the American Revolution. Sugarcane production began in the southeastern United States in 1794, and the first sugar beet factory was established in California in 1838.

A century and a half ago, sugar was the king of commerce. To England, its holdings in Antilles represented more wealth than its 13 colonies, and sugar was the most important trade commodity. In France, where Napoleon ruled, frustration over the English blockade of sugarcane imports resulted in the emperor's decree that 70,000 acres of sugar beets be planted to help make France self-sufficient. From such lofty and crucial beginnings, sugar is now only one of several internationally traded commodities and one whose role as a sweetener is being threatened by substitutes.

Most sugar is either consumed in the country where it is produced under government-controlled pricing arrangements or exported from one country to another under prearranged agreements. The sugar which is not subject to such arrangements is freely traded among a number of nations, corporations, and individuals. The free market for sugar is thus classified as a "residual market"—a market in which sugar traded freely is only a residual of total world production. Since the free market for sugar is typically 20 to 25 percent of world production, a 5 percent change in production can represent a 25 to 33 percent change in free market sugar supply, which is one of the reasons for the historically high volatility of sugar prices.

Supply

Sugar (or sucrose) is produced from both sugarcane and sugar beets. Though the location of the production, the nature of production, and the processing techniques for these two sources of sugar are different, refined sugar produced from each is indistinguishable.

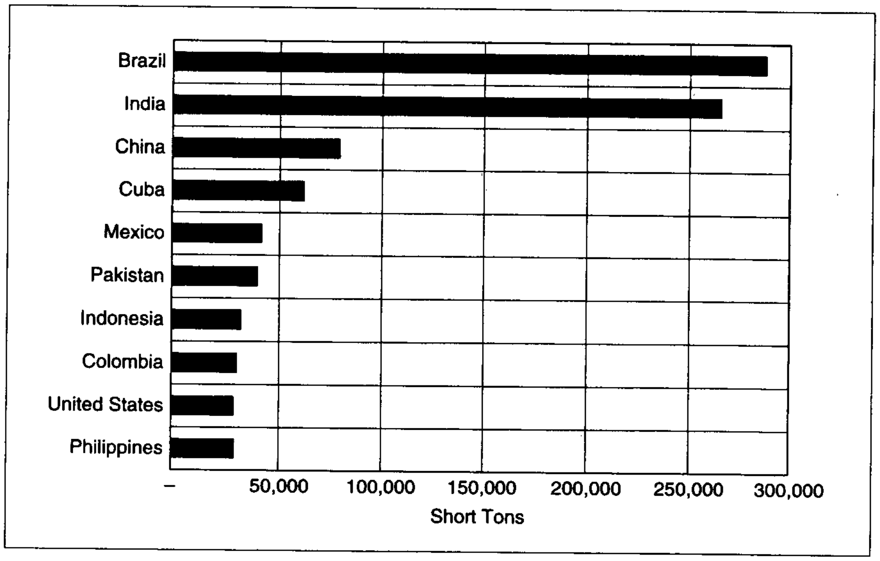
Sugarcane is a tall, bamboolike tropical grass which requires 1 to 2 years after it is planted before it can be harvested, and then it issues new shoots for approximately 10 years; that is, it is a perennial. It ranges from 8 to 12 feet in height and is about 1 inch in diameter. Sugarcane is grown in the warm, moist climate of the tropical and subtropical zones. Brazil has been the major producer of sugarcane, followed by India and Cuba, as shown in Table 21-4. In the United States, sugarcane is grown in Florida, Louisiana, Texas, and Hawaii, although the growing season varies, being as short as 12 months in Louisiana and as long as 2 years in Hawaii.

Sugar beets are white, tapering roots that are about 1 foot long and weigh about 2 pounds. They are planted in the early spring and harvested before the first winter freeze. Sugar beets are grown in temperate zones. As shown in Table 21-5, Russia is the major producer of beet sugar, with France, Mexico, West Germany, Poland, and the United States being other major producers. In the United States, sugar beets are grown in 16 states, mainly in California and the Red River Valley of Minnesota and North Dakota and South Dakota, all west of the Mississippi River except Ohio and Michigan.

Although almost every country in the world produces sugar, sugar is still actively internationally traded. The major exporters are Cuba, Brazil, Australia, the Philippines, and France. The largest importers are the United States, Japan, Russia, and England. Some of the world's largest sugar producers export rather than consume their production. On the other hand, the United States is one of the world's largest sugar producers but also one of the largest importers, importing approximately half of the entire amount used. Table 21-6 shows the total U.S. supply and utilization, including imports and exports.

TABLE 21-4

Leading Sugar-Cane Growing Countries
Figures are for a 3-year average, 1991–1993



Source: Food and Agriculture Organization of the United Nations.

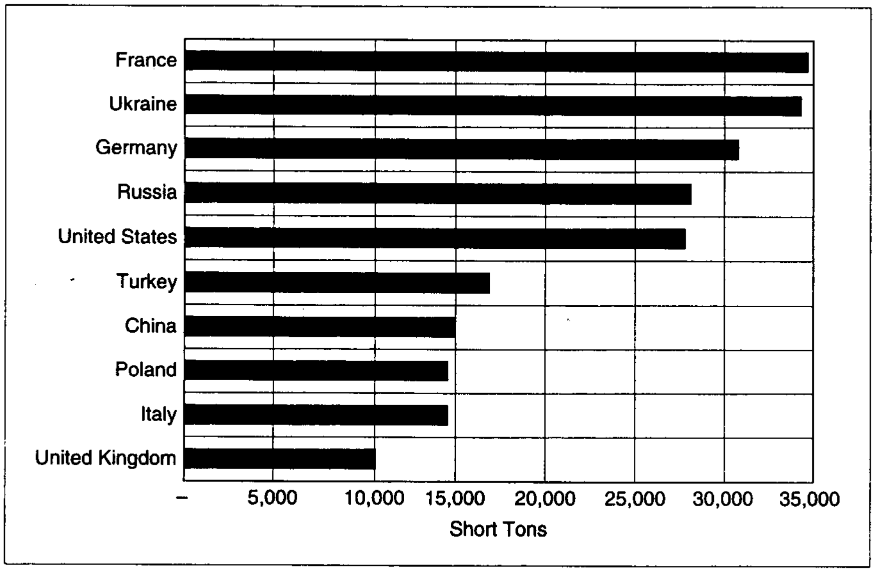
The United States grows both sugar beets and sugarcane. Because its climate is mainly temperate, beet planting predominates in the United States, and only in the southernmost states and Hawaii is sugarcane planted in any quantity. Sugarcane does particularly well on the coasts of Louisiana, where there are tropical temperatures and a moist sea breeze. Sugar beets thrive in Colorado, where there are moderate temperatures and a definite annual spring-fall cycle, and in several other states west of the Mississippi.

At any particular time of the year, sugar is being planted or harvested somewhere in the world, but there are, nevertheless, significant seasonal variations. On the other hand, sugar beets are usually harvested in the fall, with planting occurring during the spring. For the latter reason, the world sugar crop year runs from September through the following August.

Centrifugal sugar accounts for more than 85 percent of the world's sugar production and virtually all the sugar traded. Noncentrifugal sugar is produced by an alternate process and is consumed almost exclusively in the country where it is grown.

TABLE 21-5

Leading sugar-beet growing countries
Figures are for a 2-year average, 1992–1993



Source: Food and Agriculture Organization of the United Nations.

Harvested sugar beets and sugarcane must be submitted to considerable complicated processing before becoming raw sugar and a product of trade. The main steps are extraction, purification, evaporation, crystallization, and centrifuging. Raw sugar is further refined by means of a long series of processes. The growing, processing, and refining of both beet and cane sugars are very capital-intensive.

During the processing, sugar beets are sliced, pressed, and then processed directly into refined white sugar or into an intermediate product called "thick juice." Thick juice can be stored in tanks at the refinery and then processed into refined white sugar as needed. The processing plants are located in the producing areas because it is not efficient to transport sugar beets due to their perishability and bulk.

Sugarcane refiners in the United States receive cane from sources throughout the world as well as the domestic markets, and refining is, thus, not seasonal. The imported cane sugar is in the form of raw sugar (96 percent sucrose), which is produced from sugarcane in several tropical coun-

TABLE 21–6

World Sugar Production, Supply and Stocks/Consumption Ratio, thousands of metric tons (raw value)

Marketing Year	Beginning Stocks	Production	Imports	Total Supply	Exports	Domestic Consumption	Ending Stocks	Stocks/ Consumption Percentage
1987–8	23,117	103,786	27,076	153,979	27,076	106,554	20,349	19.1
1988–9	20,349	105,562	28,671	154,582	28,671	106,516	19,395	18.2
1989–90	19,395	108,772	33,179	161,346	33,179	108,709	19,458	17.9
1990–1	19,458	113,458	32,538	165,391	32,538	111,926	20,927	18.8
1991–2	20,967	116,512	30,802	168,281	30,802	113,929	23,550	20.7
1992–3	23,550	112,089	29,022	164,661	29,022	114,102	21,537	18.9
1993–4	21,537	109,787	29,753	161,077	29,753	112,801	18,523	16.4
1994–5	18,574	115,842	30,532	164,948	30,532	113,622	20,794	18.3
1995–6*	20,794	122,509	35,084	178,387	35,084	118,608	24,695	20.8
1996–7†	24,694	124,989	35,475	185,158	35,475	122,930	26,753	21.8

* Preliminary.

† Forecast.

Source: Foreign Agricultural Service, U.S. Department of Agriculture.

tries and shipped to the United States for further processing. Processing and refinery plants are located mainly in Louisiana but also in other Atlantic and Gulf Coast cities close to ports into which sugarcane is imported.

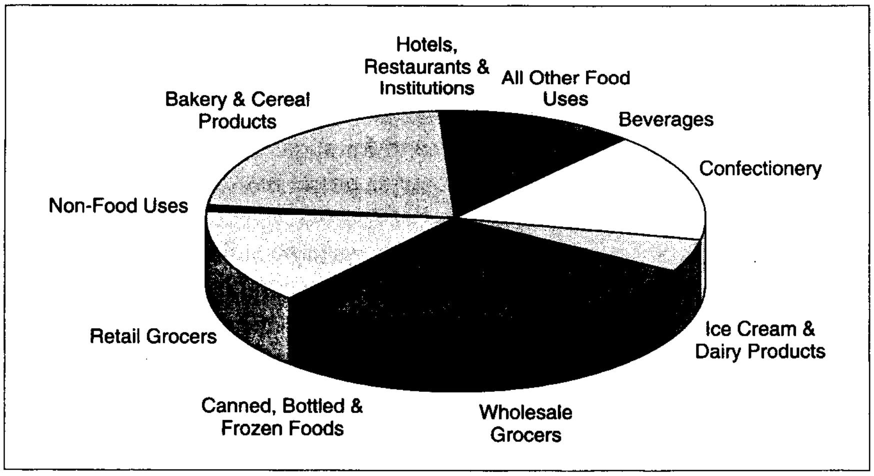
Refined sugar is then sold by the refiners directly to the end users in the food industry, wholesalers, brokers who locate buyers for the sugar, and companies that prepare the sugar for sale as liquid or solid sugar. It may be sold to the U.S. government, according to the price support program.

Demand

In the United States (the world's largest consumer of sugar) and other major sugar-consuming countries, the major users of sugar as an input for producing other products are bakers, makers of beverages, and confectioners. Table 21-7 shows the major uses of sugar in the United States. The largest use, however, is the direct sale of refined sugar in stores. While the total consumption and per capita consumption of sugar have grown considerably over the last 40 years, these measures of sugar use for the United States have declined in the last decade, due to the uses of other sweeteners and the lower use of sweeteners in general.

TABLE 21-7

Sugar, Refined—Delivered to End User in the United States



Source: U.S. Department of Agriculture.

During recent years, domestically produced beet and cane sugar have been responsible for 35 to 60 percent of the total sweetener consumption in the United States (20 to 30 percent for beet sugar and 15 to 30 percent for cane sugar), imported cane sugar for 30 to 45 percent, and corn sweeteners for 10 to 20 percent, with minor contributions from other sweeteners, such as honey and maple syrup. The per capita consumption of refined sugar in the United States has decreased significantly in recent years, even though the per capita consumption of all sweeteners has increased, due primarily to the increased use of corn sweeteners, particularly high-fructose corn sweetener (HFCS).

Price Determinants

Most internationally traded sugar is priced on a long-term forward basis. A smaller amount of sugar is traded on a current-market basis. Although the same factors affect the prices on both markets, they affect the prices of the former method of sales with a longer lag.

There are several economic and political determinants of sugar prices, on both the demand side and the supply side. On the demand side, per capita income and population are important economic determinants. Although at high levels of income, sugar consumption depends less on the level of per capita income (that is, the income elasticity of demand is low), increases in the level of income and population growth in third world countries have led to an increase in sugar consumption. While sugar prices also affect the demand for sugar, the effect of prices on sugar demand is fairly small; that is, sugar demand is fairly price-inelastic, at least in the short run. The short-run price inelasticity of demand causes significant sugar price changes in response to changes in sugar supply. The strength of the U.S. dollar also affects the demand for sugar somewhat.

However, in the long run, high sugar prices have caused significant shifts from sugar to other sweeteners, both natural sweeteners, particularly HFCS, and artificial sweeteners, such as aspartame and saccharine. While the market share of HFCS as a sweetener has doubled in the last two decades, thus mitigating sugar price increases, the use of HFCS is limited because it is available only in liquid form. However, HFCS will likely continue to be used increasingly for beverages, bakery products, cereal products, and several other processed items.

Because the demand for sugar is, in the short run, relatively price-inelastic, changes in the supply affect prices significantly. In this regard, the weather and other crop conditions, including acreage planted and yields, in sugar-producing countries affect sugar production and, as a result, sugar prices. Weather is an important determinant of supply, particularly for sugarcane. Since sugarcane accumulates the greatest percentage of its sugar in its final period of growth and must be quickly harvested once it is mature to ensure a maximum yield, an unusual amount of rain at harvest time may reduce cane sugar yields. In addition, both cane and beets are subject to disease from more than 40 insect pests. The leafhopper in Hawaii has caused a decrease in cane yields of as much as 80 percent over three successive crops.

Another economic factor which affects sugar prices is the reportable positions of sugar stocks, which measure the balance between supply and demand. The September 1 stock, at the change of the crop year, is particularly significant. In this regard, the ratio of sugar stocks to sugar consumption is a useful indicator of prospective sugar price changes—sugar prices tend to increase as this ratio decreases. This indicator has tended to vary between 20 and 36 percent.

Overall, a significant portion of the world's sugar is insulated from the free market due to national price support programs, as in the United States and Europe. Due to the price support and subsidy programs in the United States, Europe, and other countries, there is a tendency for world supply to outrun world demand. For example, the European Economic Community, a net exporter prior to 1973, subsidizes its sugar beet producers and was a significant exporter of sugar during 1984. A large share of world trade in sugar is a result of bilateral and multilateral agreements, usually on a forward contractual basis. The open market has, thus, become a residual market. For these reasons, small changes in the supply of or demand for sugar can cause substantial price changes. This excess supply and price variability is supported by the short-run elasticity of supply of sugar due particularly to the multiharvesting of sugarcane during the year. Sugar beets, however, are annual crops, and so the supply can be changed more effectively in the short run due to price changes.

Two political-economic factors which affect U.S. sugar prices are international agreements regarding sugar, mainly the International Sugar Agreement, and U.S. policies regarding sugar.

International Sugar Agreement The International Sugar Agreement (ISA), first established in 1937 and more recently (at the beginning of 1978) put into effect, is a multinational agreement designed to stabilize the world price of sugar. According to the intended mechanism, participating countries build up reserve stocks and impose export quotas when world sugar prices are low and release stocks and remove quotas when prices are high. The effectiveness of the ISA has been limited, however, due to limited support from and limited participation by sugar-producing countries, particularly the European Economic Community countries. The ISA expired on December 31, 1984. At the Geneva Conference of the International Sugar Organization (ISO) during June and July 1984, attempts to establish a new international agreement with economic provisions to stabilize prices failed due to the weak state of the sugar market and international politics. However, a new administrative agreement was made. While this administrative ISA does not have any authority to restrict exports or maintain price levels, it is a structure for facilitating the collection and exchange of statistics and for continuing negotiations.

Government Programs Sugar receives the same type of price support as many of the grains. During 1981, the trigger level for loans for sugar was set at 17 cents per pound of raw sugar at the refinery. When sugar prices are below this level, the refiner receives 17 cents per pound, which is paid to the sugarcane or beet grower until the refiner chooses to repay the loan plus interest or default to the Commodity Credit Corporation as discussed in Chapter 18.

There is also a dual program based on duties and market stabilization prices for raw sugar imported into the United States. Given a duty, which was 2.8125 cents per pound during 1982, an adjustable fee is charged such that the sum of the market price of sugar plus the duty, fee, and transportation costs equals the market stabilization price.

U.S. import quotas were also introduced during 1982 to complement the price support programs. It is due to these three U.S. government programs to support U.S. sugar prices that U.S. sugar prices are significantly higher than world sugar prices, as reflected in the prices of the two sugar futures contracts discussed below. During 1985, the government lowered its import quotas to increase the degree of protection for both U.S. beet producers and U.S. cane producers. However, CCC stocks continued to increase as sugar producers found it more attractive to sell their sugar to the government.

Over the last decade, world sugar prices have been volatile with long periods of surplus, due to the factors discussed above, and shorter periods of shortages and price increases. Prior to the 1960s, sugar prices were fairly stable due to international sugar agreements. But the dissolution of these agreements since that time has contributed to the volatility.

The short-run inelasticity of demand and the subsidization of sugar production, particularly in the United States and Europe, led to the chronic oversupply of sugar and low prices for extended periods of time. However, when there is a shock on the supply side due to weather or pests, the short-run inelasticity of supply mitigates the supply response to this condition, and prices increase significantly.

Due to the reduced demand and increasing supply, including the considerable supply induced by government policies, world sugar prices declined to less than 3 cents per pound during July 1985, even though the production cost of efficient producers was 9 cents and the cost of other producers was much higher. Many experts forecast that the sugar market will remain in an oversupply condition.

Futures Contracts

In the United States, there are two sugar futures contracts traded at the New York Coffee, Sugar and Cocoa (NYCSC) Exchange and one traded at the Mid-America Commodity Exchange. Of the two NYCSC Exchange sugar contracts, one is for world sugar (No. 11 sugar)—that is, sugar that is not within the protected U.S. market—and the other is for the protected U.S. market (No. 12 sugar—domestic). The No. 11 sugar (world) contract is based on raw sugar from 26 producing countries, deliverable in the country of origin, while the No. 12 sugar (domestic) contract is based on the same raw commodity, but the sugar is deliverable at four U.S. locations: New York, Philadelphia, Baltimore, and New Orleans. The sugar deliverable on the No. 12 sugar (domestic) contract is either produced in the United States or imported and has had its transportation and import duties paid. The No. 11 sugar (world) contract is based on free sugar that is subject to the import restrictions and fees of the consuming country.

Both NYCSC Exchange contracts are based on 112,000 pounds (50 long tons).[1] The trading months of both contracts are January, March, May, July, and September, but the No. 11 sugar contract is traded, in addition, in October, while the No. 12 sugar contract is traded, in addition, in November.

The MidAmerica Commodity Exchange also trades a domestic contract. It is based on 40,000 pounds of free-flowing bulk extrafine granu-

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[1] One long ton equals 2240 pounds.

lated sugar, deliverable in Chicago. There are also three foreign sugar futures contracts: (1) raw sugar and white sugar (world sugar) at the London Sugar Terminal Market, (2) No. 12 domestic sugar at the Tokyo Sugar Exchange, and (3) white sugar (world sugar) at the International Market of White Sugar of Paris.

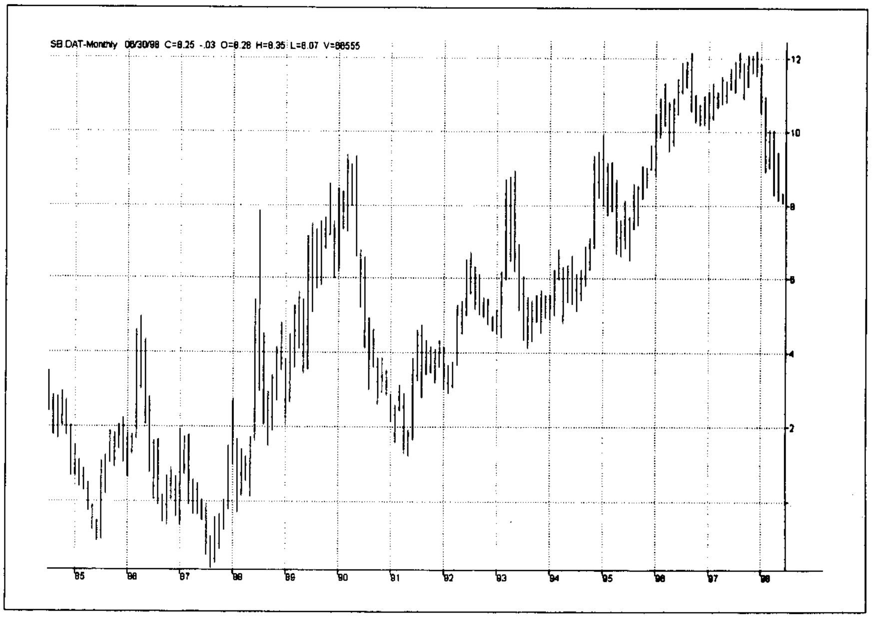
Figure 21-2 shows the recent price history of the No. 11 (world) sugar futures contract traded at the Coffee, Sugar and Cocoa Exchange in New York.

Speculative Uses

While sugar futures have substantial hedge uses for sugar-producing companies and countries, sugar refiners, and sugar users, sugar futures have also been extensively used by speculators. Speculators buy or sell the futures contracts outright on the basis of the price determinants discussed above.

FIGURE 21–2

Sugar futures, 1983–1997. Chart created using Trade Station 4.0 by Omega Research, Inc.



Sugar futures contracts, within a crop year, are usually traded on a cash-and-carry basis. When a deferred month is traded at a premium which exceeds the cost of carry to a deferred month, the market is bullish on long-term prices, and vice versa. New-crop months, those beginning with the June contract, are usually traded at a premium to prior old-crop months, although new-crop prices may be at a discount if a large supply is expected in the new crop year. Speculators also conduct intracontract spreads within the crop year or across crop years, or they spread world sugar contracts against domestic contracts.

Sources of Information

There are several important government and private sources of information on sugar. These include the following:

1. The USDA, through its Foreign Agricultural Service and its Agricultural Marketing Service, provides several sources of data, including *Foreign Agriculture, Sugar and Sweetener Situation,* and *Crop Production.*
2. F. O. Licht's *International Sugar Report* and *World Sugar Statistics* provide data on world sugar markets.

Notes from a Trader—Sugar

World sugar is one of the few commodities for which there can be a spread between U.S. and London markets. The spread for world sugar, however, depends not only on the sugar prices but also on the dollar-pound exchange rate. The world sugar contract in the United States shows more volatility and is, thus, a better trading vehicle than the domestic sugar contract because fluctuations in the latter are tempered by U.S. quotas and other support policies.

The contract for 112,000 pounds results in an unusually high move of $11.20 per point, which represents relatively high leverage during a price move. Sugar markets sometimes erupt suddenly after quiet periods of months or even years and may catch both the trader and his or her margin clerk unawares.

Many traders who rely most heavily on fundamentals tend to overemphasize cane sugar because of the influence of headlines regarding tropical hurricanes and political upheaval, whereas sugar beet crops do not often provide newsworthy events. The sugar from beets, however, is identical with the sugar from cane, and so the importance of beet sugar is often underestilated sugar, deliverable in Chicago. There are also three foreign sugar futures contracts: (1) raw sugar and white sugar (world sugar) at the London Sugar Terminal Market, (2) No. 12 domestic sugar at the Tokyo Sugar Exchange, and (3) white sugar (world sugar) at the International Market of White Sugar of Paris.

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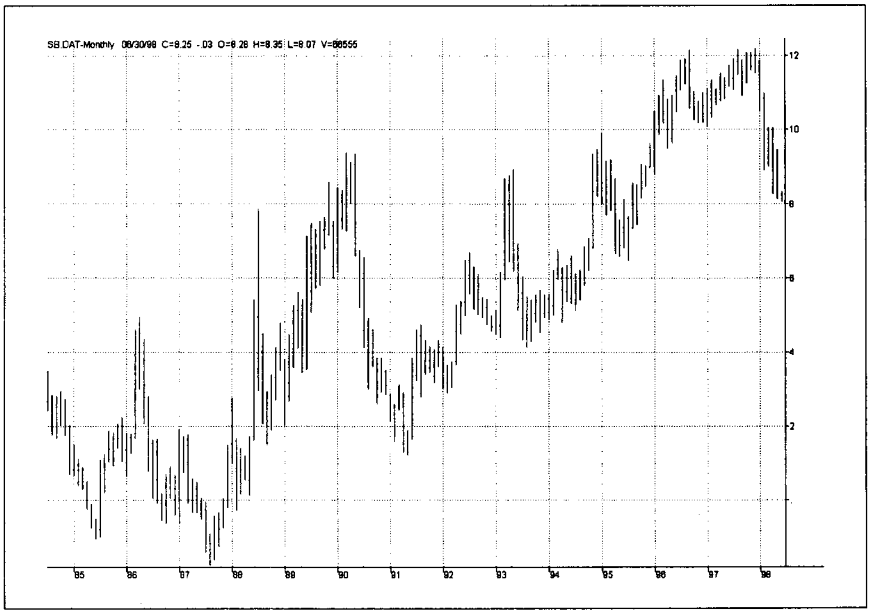

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COCOA

Introduction

Cocoa has been used in Central America, where it is grown, for centuries. It has been so dominant as a drink at times that it has also been a medium of exchange. The use of cocoa spread to Europe during the sixteenth century, but cocoa beans were used only to make a drink until the nineteenth century, when two developments diversified their use. In 1828, a Dutch manufacturer discovered that some of the fat of the cocoa bean, called cocoa butter, could be removed and combined with sugar—the manufacturer ground cocoa beans to produce chocolate. Later in the nineteenth century, a Swiss candy maker discovered that adding milk to the chocolate, thus making milk chocolate, improved the taste of the chocolate.

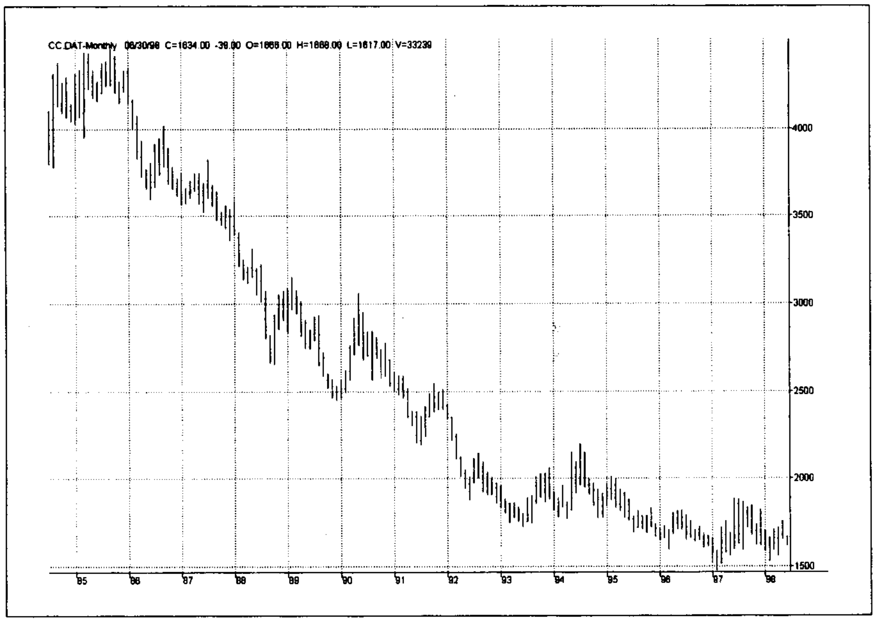
After a decade of downward movement, cocoa prices began to rise in late 1993 in response to a concerted effort by International Cocoa Organization (ICO) member countries to limit production. Previously, ICCO agreements were concerned more with the creation of buffer stocks and less with production management. Overproduction stemming from favorable prices in the 1970s led to the low prices of the 1980s. ICCO stocks are now being liquidated slowly to avoid depressing prices. In March 1995, cocoa futures were being sold on the Coffee, Sugar and Cocoa Exchange (CSCE) for $1371 per metric ton, the highest price in almost 7 years (see Figure 21-3). Average U.S. spot cocoa bean prices have increased for all major suppliers in the past two years.

Supply

Cocoa trees, from which cocoa beans are derived and from which all cocoa and chocolate products are made, grow in tropical climates where the rainfall exceeds 50 inches per year. They grow in an area between 20° north and 20° south of the equator. Prior to the twentieth century, cocoa production was dominated by South and Central American countries, but since then West African countries have become the dominant producers. As shown in Table 21-8, the Ivory Coast is the world's largest producer of cocoa beans, followed closely by Brazil. Ghana, Nigeria, and Asia and Oceania are also significant producers.

FIGURE 21-3

Cocoa futures, 1984–1997. Chart created using Trade Station by Omega Research, Inc.



Due to the differences in the sources of production and the uses of cocoa, over two-thirds of all cocoa production is traded internationally. The United States is the world's largest importer of cocoa, followed by West Germany, the Netherlands, Russia, England, and France, as shown in Table 21-9.

Cocoa and chocolate are made from the seeds, or cocoa beans, from the cocoa tree. To be precise, the tree on which cocoa beans are grown is the cacao tree; but due to a misspelling many years ago, probably by English importers, it has come to be known as the cocoa tree and its beans as cocoa beans.

Cocoa production requires considerable time. Cocoa trees do not produce usable quantities of beans for the first 5 years after planting. The quantity of beans produced then increases until the trees reach their peak yield at 15 years, and this yield is maintained through the thirtieth year. Yields then decline until the trees are no longer commercially viable,

TABLE 21–8

World Production of Cocoa Beans in Principal Producing Countries, thousands of metric tons

Crop Year Beginning October	Brazil	Cameroon	Colombia	Dominican Republic	Ecuador	Ghana	Indonesia	Ivory Coast	Malaysia	Mexico	Nigeria	Papua New Guinea	Peru	Philippines	Togo	Venezuela	World Total
1986–7	365	123	52.0	45.2	77.0	228	167	620	167	37.9	100	34	10	6.6	15.7	13.9	2013.5
1987–8	400	133	53.8	50.0	76.0	188	70	674	227	47.5	145	35	10	7.2	12.0	12.5	2214.2
1988–9	334	124	56.3	44.3	82.0	300	98	849	225	41.0	160	48	10	7.8	10.0	11.5	2471.3
1989–90	356	122	58.0	57.0	102.0	295	135	710	240	38.5	155	41	10	9.0	7.6	14.4	2419.1
1990–1	375	100	60.0	42.3	104.0	293	165	804	235	38.9	160	34	10	9.0	6.8	16.5	2525.5
1991–2	301	107	60.5	48.8	82.4	243	200	747	217	41.5	110	41	10	9.0	8.0	16.0	2301.0
1992–3	330	100	60.0	50.8	76.0	312	240	700	225	43.5	140	39	10	6.0	6.0	16.5	2415.5
1993–4	281	105	60.0	58.7	80.0	312	280	850	204	34.0	130	31	10	7.0	4.0	16.0	2519.2
1994–5*	228	107	60.0	56.8	82.0	315	255	873	134	38.5	130	29	10	7.9	4.0	11.0	2398.2
1995–6†	225	130	60.0	57.7	81.5	420	275	1,200	125	42.1	140	30	10	7.3	2.0	14.0	2876.3
1996–7‡	198	110	60.0	57.0	82.5	390	280	1,050	120	43.0	150	30	10	7.0	2.0	14.0	2660.2

* Preliminary.

† Estimate.

‡ Forecast.

Source: Foreign Agricultural Service, U.S. Department of Agriculture.

TABLE 21–9

World Absorption (Consumption) of Cocoa, thousands of metric tons[*]

Crop Year, Beginning October	Belgium	Brazil	Canada	Colombia	Cote d'Ivoire	France	Germany	Italy	Japan	Malaysia	Netherlands	Singapore	Spain	United Kingdom	United States	Former USSR	World Total
1986–7	34	233	19.0	48.0	89.0	35	205	43	36	36.0	190	33	33	94.0	228.0	164.0	1896.0
1987–8	35	241	21.0	46.0	102.0	40	245	46	40	40.0	215	40	43	100.0	241.0	132.0	1998.0
1988–9	41	210	22.0	41.0	110.0	44	265	46	40	47.0	234	46	40	112.0	237.0	201.0	2121.0
1989–90	47	239	24.0	45.0	111.0	59	287	51	47	72.0	241	52	42	120.0	270.0	106.0	2217.0
1990–1	45	275	25.0	47.0	115.0	70	295	56	52	77.0	268	51	45	145.0	272.0	83.0	2339.0
1991–2	46	216	31.0	44.0	108.0	67	306	62	49	87.0	294	50	46	153.0	307.0	25.0	2291.0
1992–3	47	218	41.0	45.0	100.0	80	331	58	39	99.0	309	46	46	169.0	326.0	95.0	2439.0
1993–4	50	224	32.0	42.0	110.0	95	319	65	38	103.0	331	51	49	170.0	317.0	90.0	2483.0
1994–5[†]	53	194	35.0	50.0	108.0	108	318	69	39	101.0	350	51	46	154.0	331.0	80.0	2554.0
1995–6[‡]	54	205	39.0	50.0	135.0	111	289	69	49	96.0	385	54	50	191.0	345.0	80.0	2688.0
1996–7[*§]	55	205	40.0	50.0	165.0	111	268	70	50	93.0	400	55	50	180.0	365.0	85.0	2762.0

[*] Figures represent the "grindings" of cocoa beans in each country.

[†] Preliminary.

[‡] Estimate.

[§] Forecast.

Source: Foreign Agricultural Service, U.S. Department of Agriculture.

between the fortieth and fiftieth years. Because of this long cycle, the supply of cocoa beans is extremely inelastic in the short run. Temporary high prices do not cause new plantings, and temporary low prices will not temper the production from trees that are currently producing.

Cocoa beans ripen over several months, so the harvest is not a short-term activity. This continuous supply throughout the year also reduces the seasonableness of cocoa production. For most growing areas, the "main-crop" period is from October through March—more than three-fourths of the world's cocoa crop is produced in this period. The smaller-yield "mid-crop" period is from May to August. Brazil's midcrop (called the "Temporao"), however, is usually larger than its main crop.

Because cocoa beans cannot be stored long in the tropical climates in which they are produced, they are typically sold to consuming countries for processing. However, the producing countries, particularly Brazil, are also increasingly processing the beans. The marketing and sales policies of various producing countries differ considerably. The Ghanaian, Nigerian, and other West African crops are, almost without exception, purchased from cocoa farmers by government marketing agencies, which then sell them to buyers for export at administratively determined prices. By contrast, Brazilian farm production is sold through free market channels, although the Brazilian government may establish minimum selling prices and export quotas.

There have been some important implications of these marketing differences. During the last decade, there have been significant increases in Brazilian and Malaysian production. These increases were, to a large extent, a response to the price increases of the period 1975–1977 and resulted from the fact that the cocoa producers themselves received these higher prices for their supply. However, the producers in the Ivory Coast and Ghana did not receive these higher prices because the governments maintained the prices paid to producers at earlier levels while charging more for the beans they sold for export. Thus, while the governments of the Ivory Coast and Ghana have increased their revenue, the production in these countries did not increase.

Brazil has also increased its processing capacity. Domestic processing not only increases the value added for the country but also improves the country's ability to store cocoa because chocolate liquor is more storable than cocoa beans. This enables the country to hold back supplies when prices are low and sell them when prices are high and also reduces transportation costs.

The mature cocoa tree is about 25 feet high. It produces small flowers and fruit during all seasons of the year. The ripe fruit, or pod, resembles a long cantaloupe and has 20 to 40 seeds that look like almonds. The pods are cut from the tree with long knives. They are then cut open, and the beans are taken out.

The beans are fermented via heat. If fermented naturally, the beans are put in piles, covered with banana leaves, and allowed to ferment. Fermentation, which takes approximately 2 to 9 days, generates heat, which kills the bean's germ and activates enzymes which give cocoa its unique flavor.

After fermentation, the beans are dried, by either natural or mechanical means, to prevent molding. Natural drying is simply drying the beans in the sun where they were fermented. Once fermented and dried, these beans become the commercially traded cocoa beans and are bagged for shipment. While cocoa beans are storable, they are not stored where they are produced because they deteriorate quickly in tropical weather.

Once sent to processors, cocoa beans are subject to several processing steps. They are first cleaned; then several types of beans are blended, and the blend of beans is roasted. Blends of beans are used to provide the flavor, color, and aroma desired and to utilize the many types of beans that are received and the types of beans available at a particular time. After roasting, the thin shells, or hulls, of the beans are cracked and removed. Cocoa seeds with shells removed are called "nibs"—the nib is the meat of the cocoa seed. Nibs contain about 54 percent cocoa butter, the natural fat of the cocoa bean.

The nibs, which are very dry, are then crushed and ground mechanically to release the cocoa butter. This mixture of cocoa butter and finely ground nibs is called chocolate "liquor." Due to the heat generated by the crushing, the liquor is a liquid which can be molded to form various shapes. All chocolate products are formed from the chocolate liquor—either the liquor is used as is or it is further processed. The chocolate products include baking chocolate, cocoa, milk chocolate, and sweet and semisweet chocolate.

Baking chocolate is simply the commercial form of chocolate liquor and is used in many baked products. The liquor is cooled and solidified into cakes to produce baking chocolate. Most chocolate liquor is subject to further processing, however. The liquor is pressed hydraulically, and varying degrees of the cocoa butter are squeezed out. This extracted cocoa butter has a variety of uses, but its dominant use is in the manufacture of chocolate candy.

After the cocoa butter has been squeezed out, the remaining mass from the liquor is a large, hard cake called the cocoa cake, which can then be ground into its final usable form, cocoa powder, which is a fine, reddish-brown powder. This powder is judged for quality by the amount of fat (cocoa butter) contained in it. This powder is used as a hot drink by adding milk and sugar or is used by confectioners, bakers, and other food processors. Cocoa used as a drink contains a minimum of 22 percent fat; this is the highest grade of cocoa powder.

Milk chocolate, the most popular of all chocolate products, represents the most common use of cocoa butter. Milk chocolate is manufactured by combining chocolate liquor, sugar, and whole milk with extra cocoa butter. These ingredients are mixed, blended, and rolled, and the resulting milk chocolate is sold as bars, solid chocolate, or candy coatings.

Sweet chocolate and semisweet chocolate are made in the same way as milk chocolate, except that milk is not added to the mixture. These chocolates are sold to confectioners for candy production and are used for the home production of candy, cookies, cakes, and other goods.

Demand

Cocoa is a unique product because its uses are very limited and it has no major substitutes. Its major end uses are milk chocolate, sweet and semisweet chocolate, and cocoa powder. Thus, most cocoa is consumed in high-income countries like such as the United States and northern Europe.

The United States, with its large confectionery industry, is one of the world's largest importers of cocoa beans, having imported 312,000 tons in 1994. That figure was the lowest recorded number in 5 years. Indonesia has overtaken the Ivory Coast as the largest supplier of U.S. cocoa, although Indonesian beans are selling for lower prices than beans from the Ivory Coast because of quality problems.

Price Determinants

Because, as indicated, cocoa has few uses and no substitutes, its price depends on its own supply and demand characteristics. Both supply and demand affect cocoa prices.

Current, prospective, or even rumored changes in supply have the greatest impact on cocoa prices. This is due to the fact that as a result of the nature of supply and the areas in which cocoa is produced, it is difficult to estimate supply, particularly in Ghana, Nigeria, and other African countries. Weather, pests, other crop diseases, and shipping strikes, either actual or rumored, can also affect supply and prices. A severe harmattan (a dry, dust-laden wind from the Sahara Desert) in the Ivory Coast will reduce the supply of this large producer. The importance of these factors, as well as the likelihood of rumors, is enhanced because a small number of countries, many of them remote, produce most of the total cocoa production.

On the demand side, because cocoa products are mainly luxury goods, prices have a relatively minor effect on cocoa consumption, while income and population growth have significant effects. However, the manufacturers' use of extenders such as cocoa powder during periods of high prices does cause cocoa use to decrease in response to high cocoa prices. With respect to income, cocoa consumption should continue to grow not only in America and Europe but also in South America and Africa. Cocoa consumption, however, has not grown with income in Asia.

Another commodity whose price may affect cocoa consumption is sugar. Since sugar is a major ingredient of chocolate, an increase in sugar prices should cause an increase in chocolate prices and a decrease in chocolate consumption. However, sugar candy is a major competitor for chocolate, so an increase in sugar prices should cause an increase in chocolate consumption for this reason. Overall, the two effects of sugar prices on chocolate consumption tend to nullify each other. A strong dollar, however, tends to decrease the world price of cocoa.

Given the various components of the cocoa bean production chain—cocoa beans, cocoa butter, chocolate liquor, and cocoa powder—it is reasonable to ask which component determines the prices of the others. In an attempt to derive the maximum amount of cocoa butter from the chocolate liquor, an excess of cocoa powder is usually produced—its price, thus, depends on its own demand characteristics, and its price is often very low. The importance of cocoa butter in producing milk chocolate, sweet chocolate, and semisweet chocolate makes it the dominant cocoa bean product, and its price, thus, tends to determine the prices of both chocolate liquor and cocoa beans.

Cocoa prices are also affected by inventories, which reflect the balance between supply and demand. "Afloat" inventories, in the very short run, and, in the longer run, the level of general inventories affect cocoa prices. Whereas inventories were previously accumulated only in consuming countries, producing countries are now also increasingly processing cocoa beans and storing chocolate liquor, and so inventories are internationally more balanced. Cocoa stocks equal to 3 to 9 months of use are held by manufacturers, with 6 months considered normal, so that the manufacturers can weather price increases. These inventories tend to stabilize prices. The maintenance of large inventories also allows chocolate manufacturers to maintain supplies of various types of cocoa beans so that they have the ingredients for the various blends of chocolate they produce.

Another factor that affects cocoa prices is national policies, as mentioned above. National policies have had a major impact on the supply of cocoa in several countries. Internationally, the International Cocoa Agreement (ICCA) was established to stabilize the world price of cocoa between specified upper and lower bounds. If prices fall below the lower bound, the ICCA can accumulate cocoa stocks; if prices rise above the upper bound, the ICCA can release these stocks. Recently, these price levels have been $1.10 and $1.50 per pound. For several reasons, including the absence of the world's largest producer (the Ivory Coast) and largest consumer (the United States) from its membership and the lack of funds to purchase cocoa for the buffer stock, the ICCA has not been effective in maintaining world cocoa prices. An unsuccessful attempt was made to renegotiate the agreement during March 1985.

On the basis of these factors, the major swings in cocoa prices are likely to continue. Figure 21-3 shows the recent price history of the NYCSC Exchange cocoa futures contract.

Futures Contracts

Cocoa futures contracts are actively traded on the New York Coffee, Sugar and Cocoa (NYCSC) Exchange and the London Terminal Market. There are also small cocoa futures markets in Paris, Amsterdam, and Hamburg.

In the United States, after the New York Cocoa Exchange merged with the New York Coffee and Sugar Exchange in 1979 to form the New York Coffee, Sugar and Cocoa Exchange, it moved with Comex, the New York Cotton Exchange, and the New York Mercantile Exchange to the new trading facilities at the Commodity Exchange Center in the World Trade Center. This joint move provided more traders for the cocoa contract and, thus, more liquidity. During the same year, the size of the contract was changed from 30,000 pounds to 10 metric tons (22,046 pounds), which brought the contract into conformance with the London contract, making it easier to trade against the London contract.

The NYCSC Exchange contract provides for the delivery of Grade A deliverable cocoa (including Ghana, Nigeria, and the Ivory Coast) at a premium of $160 per ton, Grade B deliverable cocoa (including Brazil, Central America, and Venezuela) at a premium of $80 per ton, and Grade C deliverable cocoa (including Sanchez, Haiti, and Malaysia) at par. Delivery can be made at ports in New York, Delaware, and Hampton Roads (Virginia). The delivery months are March, May, July, September, and December, and the minimum price fluctuation is $1 per ton, or $10 per contract.

The cocoa futures contract at the London Cocoa Terminal Market Association has been traded since 1928. It is, of course, traded in British pounds.

Speculative Uses

Cocoa speculators both day-trade on the basis of very short-run price changes and position-trade on the basis of longer-run price changes, and their trading is, in general, based on the fundamental factors discussed above and technical considerations. The supply of cocoa beans is an important element of fundamentally based trading, particularly the supply from countries such as Ghana and Nigeria whose supply data are often difficult to obtain—thus, rumors are frequent and have significant impacts.

Spreading between the New York and London contracts, which includes an exchange rate component, is also practiced.

Sources of Information

The USDA, through its monthly *Foreign Agricultural Circular,* provides crop estimates for foreign countries. The USDA publication *Sugar and Sweetener Reports* provides information on cocoa supply and demand periodically. Gill & Duffus, Ltd., also provides a weekly service on world supply and demand, the quarterly *Cocoa Market Report,* and the annual *Cocoa Statistics.* The Census Bureau provides monthly information on cocoa and cocoa products, U.S. imports, and grind.

Notes from a Trader—Cocoa

Trading cocoa presents special problems for both fundamentalists and technicians. The fundamentalists must rely on supply figures which are notoriously unreliable to make up the price model. The technicians, on the other hand, often face relatively wide bid-ask spreads, commissions and margin requirements that are higher than average, and price movements that represent only $3 per point.

There is no forecasting value in comparing the size of a given mid-crop with the size of the following main crop. There is, however, a higher correlation between a late main crop and substandard production. The trend in production and consumption is more important than the respective supply and demand levels. Seasonal studies should also be watched by fundamentalists.

COTTON

Introduction

Cotton is the fibrous overcoat of a seed—the fiber varies in color, length, and weight and in several other ways. Cotton was cultivated in China over 5000 years ago. It was introduced to the west from Persia and India over routes established by Alexander the Great. Weaving techniques were introduced into Spain in the thirteenth century and from there into the Netherlands and, in turn, England in the seventeenth century. The first American mill was established in Rhode Island in 1790. But the invention of the cotton gin, which increased productivity 50 times, by Eli Whitney in 1793 finally made possible the production of enough cotton to supply a commercial textile industry. The cotton gin removes the cotton fibers from the seeds.

Supply

Cotton is grown in over 75 countries throughout the world. Until World War II, the United States was clearly the dominant producer of cotton. China uses a very labor-intensive method of producing cotton, and its crop has been relatively unaffected by bad weather. Turkey and Egypt are other major cotton producers. In the United States, Texas is the leading cotton producer, followed by Mississippi, California, Arizona, and Arkansas.

The four largest consumers of cotton recently have been China, Russia, the United States, and India, as shown in Table 21-10. Japan is the world's largest importer of cotton. France is also a large importer.

Although most of the cotton that is traded internationally is upland cotton, there are many different varieties of this general type of cotton. Upland cotton is differentiated from Sea Island cotton, the type first grown in the southeast, mainly in Georgia and South Carolina. In addition to including most U.S. cotton, upland cotton includes most medium-staple and medium-long-staple cottons in the world, although there are some long-staple and extra-long-staple cottons grown in Egypt, the Sudan, and Peru.

TABLE 21–10

World Consumption of All Cotton in Specific Countries, thousands of 480-lb bales

Crop Year Beginning Aug. 1	Argentina	Brazil	China	Egypt	France	Germany	India	Italy	Japan	Mexico	Pakistan	Poland	United Kingdom	United States	Uzbekistan*	World Total
1982–3	460	2,600	16,400	1,370	765	928	6,250	1,030	3,290	625	2,450	650	230	5,513	9,200	67,862
1983–4	514	2,435	16,000	1,310	745	976	6,531	1,170	3,300	528	2,030	650	234	5,921	9,300	68,612
1984–5	464	2,665	15,500	1,367	724	1,000	7,117	1,200	3,187	550	2,264	712	248	5,538	9,500	69,401
1985–6	551	3,100	19,500	1,550	672	1,000	7,191	1,170	3,146	670	2,342	750	248	6,413	9,600	76,888
1986–7	575	3,285	20,200	1,290	710	1,100	7,847	1,419	3,445	580	2,990	600	225	7,452	9,350	82,239
1987–8	575	3,399	20,000	1,334	690	1,110	7,612	1,381	3,477	600	3,600	715	216	7,617	9,300	83,499
1988–9	551	3,766	20,500	1,300	640	910	8,139	1,424	3,408	650	3,904	725	193	7,782	9,100	85,565
1989–90	533	3,445	20,000	1,352	600	1,435	8,667	1,450	3,229	725	4,801	650	170	8,759	9,200	86,579
1990–1	597	3,215	20,000	1,457	530	955	9,018	1,470	3,027	712	5,648	410	140	8,657	8,700	85,677
1991–2	606	3,215	19,000	1,465	484	830	8,674	1,447	2,783	772	6,482	275	100	9,613	860	86,136
1992–3	588	3,445	21,500	1,640	470	680	9,761	1,400	2,301	740	6,634	390	85	10,250	950	85,770
1993–4	550	3,675	20,900	1,530	500	750	9,950	1,375	2,060	825	6,500	400	85	10,418	925	85,325
1994–5	459	4,000	20,200	1,350	500	660	10,334	1,525	1,800	800	6,750	400	90	11,198	750	84,574
1995–6†	460	3,900	19,500	1,010	450	610	11,400	1,470	1,520	1,000	7,000	415	90	10,604	875	84,304
1996–7‡	460	4,000	19,000	1,150	450	590	11,800	1,470	1,425	1,200	7,100	425	90	11,000	920	85,345

* Formerly part of the U.S.S.R.; data not reported separately until 1991.

† Preliminary.

‡ Estimate.

Source: Foreign Agricultural Service, U.S. Department of Agriculture.

Upland cottons comprise a variety of combinations of grade, staple, and micronaire. Grade is based on three factors: color, foreign matter, and preparation. Color refers to brilliance or spotted character. Foreign matter is the amount of impurity, including dirt, bark, and leaf, in the cotton, which is affected by the types of harvesting and ginning. Preparation refers to the roughness and uniformity of the cotton.

A second characteristic of cotton is the length of its staple: short staple is under $\frac{13}{16}$ inch; medium and medium-long staple is between $\frac{13}{16}$ inch and $1\frac{3}{32}$ inches; long staple is from $1\frac{1}{8}$ to $1\frac{5}{16}$ inches; and extra-long staple is over $1\frac{3}{8}$ inches. Upland cottons have medium and medium-long staples.

The third characteristic of cotton, micronaire, also called "mike," is measured by an instrument, whereas the other characteristics are determined by observation. Micronaire determines the maturity of cotton and is measured by airflow through the cotton. This is an important characteristic because overly mature or immature cotton has less value than mature cotton.

The growth of cotton requires about 180 days of no-frost weather. Cotton grows best in hot weather with adequate, uniformly spaced applications of moisture. Variations from these requirements can cause substantial reductions in the size and quality of the crop. As a result, there are four cotton-producing regions in the United States. The first is the southeast (the Carolinas, Georgia, and Alabama), which was the original cotton-growing region in the United States and currently dominates the textile industry. It is not now a major cotton-producing region, however, mainly because it is used for other crops, such as soybeans. The second region is the five-state area of Arkansas, Louisiana, Mississippi (the second largest producer of cotton in the United States), Missouri, and Tennessee. This region grows upland cotton with staples from $1\frac{1}{32}$ to $1\frac{1}{8}$ inches.

The third region is the High Plains of Texas around Lubbock, which is intensively devoted to cotton. This area grows upland cotton with staples averaging approximately 1 inch—for this reason, the cotton sells at a discount to other U.S. cotton. The cotton produced in this region bears the highest risk of any U.S. crop due to droughts during the planting and growing seasons and severe hailstorms and early frosts in the northern areas and at higher altitudes. Oklahoma is another producer of cotton in this region.

The San Joaquin Valley of California developed cotton production during 1920 due to USDA and state policies to develop an alternative supply of Egyptian-type cotton. California is the third largest producer of cotton in the United States. Other western cotton producers are Arizona and New Mexico. Cotton in these states is grown on irrigated land with high per-acre yields. A less important cotton-producing area is the Rio Grande Valley in Texas, which is fairly small but is the earliest-planted region—it is planted in mid-March, 2½ months before planting in the High Plains.

The planting season for cotton in the United States begins as early as mid-March in the Rio Grande Valley of Texas and as late as mid-June in the High Plains of Texas. But the majority of U.S. cotton is planted during April. Similarly, although the harvest occurs as early as late June in the Rio Grande Valley and as late as December in the High Plains, most of the harvesting occurs in October and November. The crop year for cotton is considered to begin on August 1.

Demand

Approximately one-half of the cotton consumed in the United States is used in the manufacture of clothes. The remainder is used for household and industrial uses. Given these uses, the demand for cotton is fairly stable.

While synthetic materials have not affected the worldwide demand for cotton, they have affected the U.S. demand. Synthetics have made major inroads in the U.S. market, and the 1982 U.S. consumption of cotton was at its lowest since 1911. Since the introduction of rayon in the 1930s and the more recent introduction of polyester, synthetics have grown in use due to their lower cost, their resilience, and the fact that they do not need to be ironed. In addition, there has been an increase in the level of cotton and noncotton textile imports from the Far East and China.

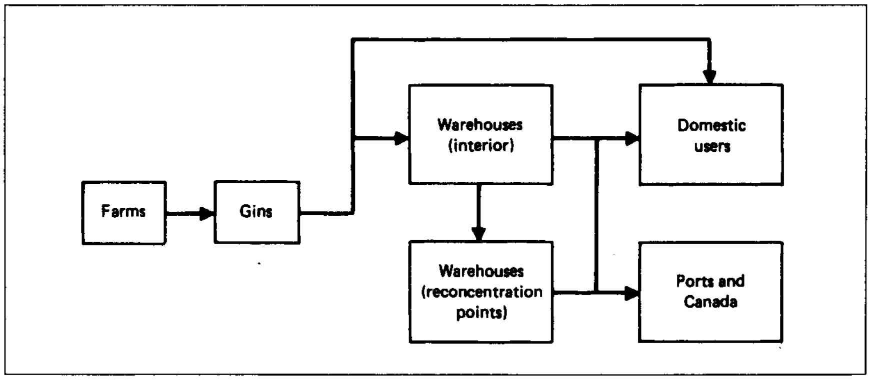
After cotton is harvested, various types of buyers (ginners, brokers, mill buyers, and shippers) begin to accumulate it from the growers and from each other for marketing purposes. Figure 21-4 shows the physical flow of cotton. October–November and February–March are periods of heavy mill consumption.

The different demand factors for both raw cotton and finished products exert their influence on different time schedules, and their total influence is complex and difficult to predict. Much of the raw cotton is acquired by vertically integrated companies that spin the raw cotton into yarn, weave the yarn into cloth, and finish the cloth. Most plants, integrated or not, are located along the Atlantic seaboard.

Some of the end uses for cotton are trousers, bedding, shirts, towels, men's underwear, fabrics, and dresses. Cotton's share of the textile market has decreased to less than 50 percent in recent years due to inroads made by synthetic fibers.

FIGURE 21-4

Physical flow of U.S. cotton. *(USDA, Economic Research Service.)*



Price Determinants

Cotton prices are determined by demand changes, supply changes, and government policies. Demand changes are important and their impact is significant, but such changes occur slowly. As indicated, the introduction of synthetics has reduced the use of cotton in the United States substantially. On the other hand, the increases in the use of cotton denim have increased cotton use. Imports of foreign cotton and noncotton textiles have also reduced U.S. cotton production.

On the other hand, changes in supply can affect cotton prices significantly and quickly. Planting intentions and acreage allotments give early indications of production levels. But weather developments throughout the planting, growing, and harvesting seasons can sometimes materially affect both the quantity and quality of production. In general, too little rainfall tends to retard germination and plant growth, whereas too much moisture reduces fruiting and causes late maturity. Temperature extremes also reduce the quality and quantity of the crop. For example, rain and cold weather may delay planting, and if there is any great amount of late cotton as a result, early frosts may kill it before it can reach maturity. A wet and cool fall can result in heavy boll rot. Insect pests—boll weevils, bollworms, and thrips—abound, but they can be successfully held down by insecticides if rain does not wash the insecticides off the plants.

The stocks of cotton, as measured by the free-market carry-over, also affect prices. A large carry-over will mitigate price increases, but a small carry-over will make it easy for prices to increase.

Government policies also affect cotton prices—during this century, they have had as great an effect on cotton prices and production as on the prices and production of any other commodity. The government may also have had as great an effect on cotton production as the weather. Government protection of cotton began in 1929, when the Agricultural Marketing Act established a loan rate for cotton at 16 cents per pound. Later, during the 1940s, 1950s, and 1960s, under a program of U.S. price supports, foreign cotton production grew considerably, and the U.S. cotton carry-over also grew considerably, reaching 17 million bales in the mid-1960s, with the Commodity Credit Corporation owning almost three-fourths of the total. Basically, U.S. farmers were growing for government consumption rather than for the U.S. private market or for export.

While the government moved toward a free-market orientation during the 1970s, there is still an extremely complex government support program for cotton which includes parity and loan levels, acreage reduction programs (ARP), and payment-in-kind (PIK) and export programs and which continues to provide signals for farmers that are not consistent with market needs. Because of price support loans for cotton above world prices, farmers continue to produce cotton and turn it over to the government. And U.S. textile manufacturers who cannot afford the high supported U.S. cotton prices and are prevented from importing lower-priced foreign cotton because of import quotas continue to become less competitive internationally.

For example, the 1985 program for upland cotton had a target price of 81 cents per pound, while that for strict low-middling, 1$\frac{1}{16}$-inch cotton was 57.3 cents per pound. To become eligible for the target price and loan provision, farmers had to plant no more than 70 percent of their upland cotton base acreage and devote the rest of their acreage to conservation uses. There were other complex parts of this program. There was also a government program for U.S. extra-long-staple (ELS) cotton. There was no payment-in-kind component for the 1985 program. This program was considered attractive for farmers, and government cotton stocks are likely to increase.

Salient supply and distribution information for cotton is shown as Table 22-11.

TABLE 21–11

Supply and Distribution of All Cotton in the United States, thousands of 480-lb bales

Crop Year Beginning Aug. 1	Area			Supply				Disappearance					Farm Price$_5$ cents/lb	"A" Index Price$_6$ cents/lb	Value of Production Million$
	Planted, 1000 acres	Harvested, 1000 acres	Yield, lb/acre	Beginning Stocks*	Production	Imports	Total	Mill Use	Exports	Total	Unaccounted	Ending Stocks			
1987–8	10,397	10,030	706	5,026	14,760	2	19,788	7,617	6,582	14,199	182	5,771	64.3	72.26	4,555.0
1988–9	12,515	11,948	619	5,771	15,412	5	21,187	7,785	6,148	13,930	(165)	7,092	56.6	66.42	4,190.5
1989–90	10,587	9,538	614	7,092	12,196	2	19,290	8,759	7,694	16,453	163	3,000	66.2	82.34	3,877.9
1990–1	12,348	11,732	634	3,000	15,505	4	18,509	8,657	7,793	16,450	285	2,344	67.1	82.87	5,075.8
1991–2	14,052	12,960	652	2,344	17,614	13	19,971	9,613	6,646	16,259	(8)	3,704	58.1	62.90	4,913.2
1992–3	13,240	11,143	699	3,704	16,219	1	19,923	10,250	5,201	15,451	190	4,662	54.9	56.87	4,273.9
1993–4	13,438	12,783	606	4,662	16,134	6	20,802	10,418	6,862	17,280	8	3,530	58.4	70.75	4,520.9
1994–5	13,720	13,322	708	3,530	19,662	20	23,212	11,198	9,402	20,600	38	2,650	72.0	92.66	6,796.7
1995–6†	16,931	16,007	537	2,650	17,900	408	20,958	10,604	7,675	18,279	(70)	2,609	75.4	85.61	6,550.7
1996–7‡	14,243	12,780	698	2,609	18,951	500	21,703	11,000	5,800	16,800	(3)	4,900		76.99	

Source: U.S. Dept. of Agriculture.

Futures Contracts

The New York Cotton Exchange (NYCE) was established in September 1870. A cotton futures market was established in New Orleans 5 months later, and subsequently, cotton futures exchanges were organized in Liverpool, Bremen, Alexandria, and Bombay, all places where spot cotton was traded.

In the early 1920s, cotton futures trading volume reached its peak, and even in the late 1940s the dollar volume of cotton futures traded equaled the trade in all other commodities combined and exceeded by several times the dollar volume of stocks traded on the New York Stock Exchange. The government price and production control programs which started during the depression of the 1930s, however, progressively supplanted the influence of the free market. Because of this and other factors, the world role of the United States as a cotton producer has declined, and the activity of cotton futures contracts has correspondingly decreased.

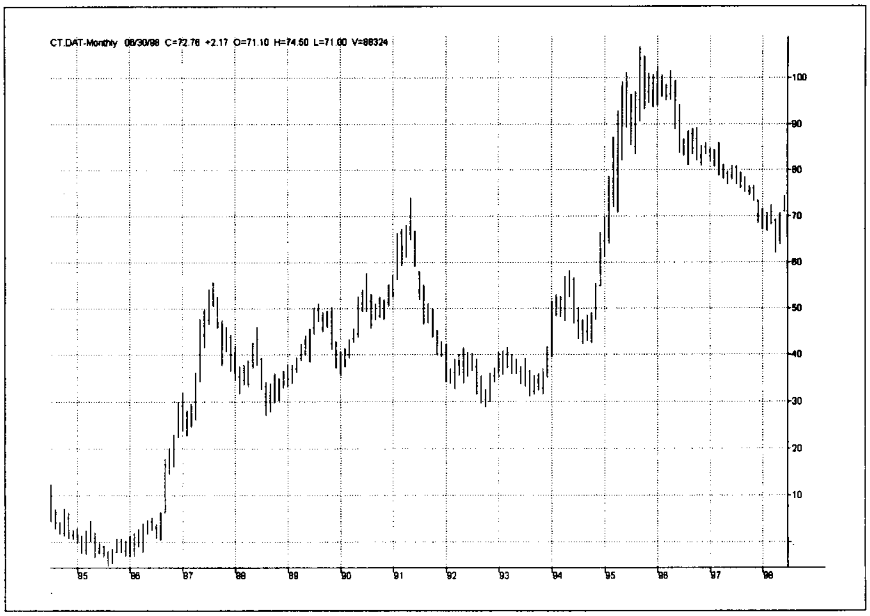
During the 1950s and early 1960s, trading volume for the existing cotton contract was very low, due primarily to the effect of government programs on cotton prices, including the buildup of government (CCC) stocks. However, on March 22, 1967, the New York Cotton Exchange initiated the trading of a new No. 2 cotton futures contract. Both volume and open interest grew substantially during the 1970s following the liquidation of the government stock and the resulting three bull markets. The futures contract is based on 100 bales, or 50,000 pounds of cotton. The price is quoted in cents per pound, and the minimum fluctuation is $\frac{1}{100}$ cent per pound, or $5 per contract. The contract calls for delivery at ports in New Orleans, Houston, and Galveston and at interior points in Memphis and Greenville. The deliverable product is strict low-middling, 1$\frac{1}{16}$-inch premium mike: "strict low-middling" refers to the grade, which is low due mainly to machine picking, which gathers impurities; "1$\frac{1}{16}$-inch" refers to the staple length; and "premium mike" refers to the micronaire. The crop year for U.S. cotton begins on August 1. The delivery months are October, December, March, May, and July.

The new No. 2 cotton futures contract has remained a successful futures contract for speculation and hedging. The open interest is approximately 20,000 contracts, and there is a reasonable trading volume.

Figure 21-5 shows the recent price history of the NYCE No. 2 cotton futures contract.

FIGURE 21–5

Cotton futures, 1984–1997. Chart was created using TradeStation 4.0 by Omega Research, Inc.



Sources of Information

The USDA is the main source of information on cotton. Particularly useful are its *Cotton and Wool Situation* reports and its weekly *Cotton Market Review.* In addition, the USDA (Economic Research Service) publishes the *Cotton Situation Report* in January, March, May, July, September, and October—this is also a particularly useful report.

The U.S. Census Bureau publishes several reports that provide data on ginnings, cotton consumption, stocks at mills and in storage, cotton goods inventories, and unfilled orders, as well as other statistics. The *Weekly Trade Report* of the New York Cotton Exchange is a useful source of general information on cotton and exchange trading. The International Cotton Advisory Committee and the National Cotton Council also publish useful reports.

Notes from a Trader—Cotton

Long-term changes have in the past affected the trading volume of the cotton futures contract and continue to affect it. Trading went from very active early in the century to moribund during the 1950s and early 1960s to very active again. Currently, long-run changes, mainly the growing use of synthetics and an increase in cotton imports, seem to be again reducing activity. However, the demand for natural fibers seems to be such that the U.S. use of cotton and the ability of U.S. producers to supply the cotton will keep the cotton futures contract active.

There are several types of cotton. In evaluating supply-and-demand conditions, traders should make certain that the conditions they are considering affect the type of cotton that is represented by their contracts. It is disconcerting to consider an increase in the demand for short-staple cotton as favorable to one's long position only to find that the demand for long-staple cotton is declining.

The cotton futures contract does not lend itself well to intercommodity spreads. The cotton spreader is limited to intramarket spreads, either within a crop year or across crop years.

ORANGE JUICE

Introduction

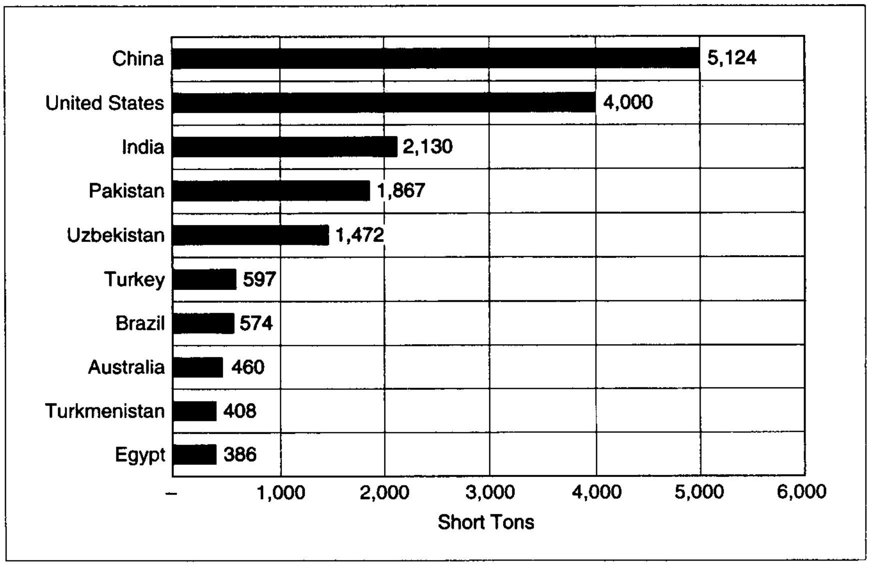
While oranges are grown in several countries throughout the world, the United States has been the world's dominant grower, as shown in Table 21-12. However, very recently Brazil's orange production has grown to equal that of the United States. Spain, Japan, and Italy are also major orange growers. In the United States, Florida is the dominant source of oranges; as shown in Table 21-13, it is responsible for approximately 67 percent of the U.S. crop. California is also a significant grower, responsible for approximately 30 percent, with Arizona and Texas also growing small amounts.

Oranges have been grown in Florida since the 1500s and in California since the 1700s. The Florida orange differs from the California orange due to the variation in the climates of the two states; the Florida orange is juicier, contains less acid, and is paler in color and thinner-skinned.

Salient information on supply, demand, and production of orange juice is shown as Tables 21-13 and 21-14.

TABLE 21-12

Leading Cotton-Growing Countries. Figures are for a three-year average, 1991–1993.



Source: Food and Agriculture Organization of the United Nations; United States Department of Agriculture.

The popularity of frozen orange juice, especially since World War II, has caused an increase in the production of oranges and also the development of the orange juice concentrate industry in Florida and its growth to its present capacity of approximately 300 million gallons a year. Frozen concentrated orange juice (FCOJ) was invented by Dr. L. G. MacDowell of the Florida Citrus Commission and two colleagues in 1947, the year the patent was given. Several scientists had previously concentrated orange juice but had found that the orange flavor disappeared with the water. Dr. MacDowell's innovation was to first overconcentrate the juice by reducing it to a thick, syrupy liquid and then add fresh orange juice and other flavorings to restore the natural taste and appearance lost during the evaporation process.

Sugar is the important ingredient in FCOJ. When processors buy fruit for concentrate, they are concerned with "pounds solids," not oranges; that is, they want solids dissolved in the juices. These solids, which remain as concentrate after the water is evaporated, consist primarily of sugar.

TABLE 21-13

World Production of Oranges, thousands of metric tons

Season	Argentina	Australia	Brazil	Cuba	Cyprus	Egypt	Greece	Israel	Italy	Mexico	Morocco	South Africa	Spain	Turkey	United States	Total
1987–8	650	394	10,400	508	138	1,387	462	627	1,343	1,942	891	681	2,442	700	7,903	30,468
1988–9	620	544	14,150	474	170	1,199	770	546	2,170	2,000	994	629	2,216	740	8,272	35,494
1989–90	750	458	12,036	604	223	1,397	932	877	2,067	1,900	775	697	2,400	740	7,083	32,939
1990–1	600	485	12,362	600	169	1,574	819	567	1,760	2,300	1,103	648	2,590	735	7,222	33,534
1991–2	640	595	14,974	428	168	1,694	820	513	1,842	2,100	780	680	2,651	830	8,175	36,890
1992–3	660	578	14,484	379	160	1,771	1,042	377	2,111	2,913	874	712	2,926	820	10,074	39,881
1993–4	746	651	13,710	350	160	1,324	854	365	2,100	3,174	916	739	2,509	840	9,462	37,900
1994–5*	712	416	16,520	350	166	1,513	930	405	1,800	3,570	657	770	2,697	920	10,474	41,900
1995–6†	580	543	16,360	380	170	1,555	870	472	2,200	3,000	1,013	930	2,434	840	10,723	42,070
1996–7‡	NA	NA	NA	350	165	1,608	850	472	1,515	2,800	780	NA	2,153	10,000	11,333	32,026

* Preliminary.

† Estimate.

‡ Forecast.

NA = Not available.

Source: Foreign Agricultural Service, U.S. Department of Agriculture.

TABLE 21–14

U.S. Salient Statistics of Oranges and Orange Juice

	*Production, million boxes**					*Florida Crop Processed, million boxes*				*Frozen Concentrated Orange Juice—Florida, million gallons (42 BRIX)*				*Brazilian U.S Imports of Frozen Concentrated OJ, million gallons (42 BRIX)*	
Season	**California**	**Florida**	**Total U.S.**	**Farm Price, $ per box**	**Farm Value, $ million**	**Frozen Concentrates**	**Chilled Products**	**Total Processed**	**Yield per box, gallons†**	**Carry-in**	**Pack**	**Total Supply**	**Total Season Movement†**	**Pack**	**Total**
1985–6	53.9	119.2	175.7	6.18	1,090.4	96.1	17.3	114.7	1.4	48.3	215.1	263.4	226.4	285.9	190.7
1986–7	57.9	119.7	181.2	7.29	1,322.5	96.2	19.7	116.8	1.5	37.0	227.9	264.9	225.1	210.4	277.8
1987–8	59.0	138.0	200.3	8.52	1,773.7	110.2	23.3	134.4	1.6	39.8	240.9	280.7	238.5	244.8	254.5
1988–9	58.9	146.6	207.2	8.90	1,848.5	107.4	29.5	146.6	1.5	42.1	239.1	281.2	235.0	245.8	243.8
1989–90	71.4	110.2	184.5	7.96	1,465.1	70.1	33.5	110.2	1.2	46.3	184.7	231.0	191.1	362.0	330.7
1990–1	25.6	151.6	179.0	8.70	1,584.7	100.4	38.2	151.6	1.5	40.0	221.2	261.2	229.2	294.8	284.5
1991–2	67.4	139.8	209.6	7.43	1,545.2	90.6	37.0	139.8	1.6	31.8	211.7	243.5	212.6	274.1	279.3
1992–3	66.8	186.6	255.8	5.77	1,489.9	128.3	47.2	186.6	1.6	31.0	292.0	322.9	269.4	394.8	418.2
1993–4‡	63.6	174.4	240.5	6.37	1,541.3	111.7	51.0	174.4	1.6	53.5	312.2	303.2	244.5	388.2	387.5
1994–5§	61.0	205.4	268.5	5.76	1,563.5	140.8	53.4	205.5	1.5	58.6	216.5	320.1	269.0	356.9	370.7
1995–6¶	66.0	202.0	270.3			129.3	62.1	203.2							

* Fruit ripened on trees, but destroyed prior to picking not included.

† 42 Brix equivalent

‡ Preliminary.

§ Estimate.

¶ Forecast.

Source: Economic Research Service; U.S. Department of Agriculture; Florida Department of Citrus.

Oranges get sweeter as the crop year progresses. Valencias provide the best juice because they have the greatest number of pounds of solids per box. Florida produces most of the FCOJ in the United States, and about 75 percent of its orange production is used for FCOJ.

Supply

Florida is the dominant orange grower in the United States and in the world. There are different harvesting periods in Florida for different types of oranges. The most active harvesting period for early and mid-season varieties is the last 2 weeks of January. The harvest period for late oranges is from mid-April to mid-June. The late oranges are primarily Valencia oranges, which are valued for their juice flavor and are the main ingredient in the production of FCOJ. The processing period for the Florida orange crop is from January until June or July. The crop year for Florida oranges, thus, is considered to be from December of one year until November of the next year.

The total U.S. supply of FCOJ is subject to considerable variability because Florida is the dominant producer and its growing region is subject to damaging freezes, which severely reduce supply. In this regard, Florida FCOJ production is similar to Brazilian coffee production. The FCOJ season begins in October with the USDA's crop estimate for the following year. At this time the concern over the winter freeze begins. Although there is no scientific evidence to support the statement that winter freezes should occur near full moons, recent freezes have, in fact, occurred near full moons. For this reason, prices tend to rise prior to the monthly full moons and, if a freeze does not occur, decline thereafter. The December full moon is particularly significant because a freeze at that time not only would lower the current orange yield but also could kill the trees, thus causing supply problems for several years. Thus, the potential increase in the futures price prior to the December full moon and the decrease afterward are particularly significant.

Since the beginning of FCOJ futures contracts, there have been six major freezes—during the winters of 1971–1972, 1976–1977, 1980–1981, 1981–1982, 1983–1984, and 1984–1985. With regard to the four freezes of the 1980s, the loss from prefreeze projections was 23 percent during 1980–1981, 28 percent during 1981–1982, 39 percent during 1983–1984, and 17 percent during 1984–1985 according to the USDA Statistical

Reporting Service. Few crops respond as adversely to severe weather as oranges. While mildly adverse weather will cause lower juice yields, a drop in temperature to 25°F damages the tree as well as the fruit, and lower temperatures may destroy the trees (replacement trees require 5 years to produce). Although artificial heat is used to protect the oranges and trees during a freeze, its effectiveness is limited.

Production responded well to the two freezes during the 1970s, although more tree plantings were shifted to southern Florida from north central Florida. But the consecutive freezes of 1980–1981 and 1981–1982 reduced Florida yields, particularly the latter freeze, which also affected southern Florida.

Brazilian orange production has increased significantly in recent years, as indicated above. Central American production has also increased, but to a lesser extent. The reduced Florida production due to four freezes in 5 years has provided a U.S. market for Brazilian production. Florida orange producers are concerned that given their recent freezes and the improved production and processing capacity and ability of Brazil, with the Brazilian government support, Brazil's contribution to worldwide supply and supply to the U.S. market will continue to increase.

Demand

Most oranges were once shipped fresh and squeezed into juice in the home. Now significant parts of the crop are converted into concentrates which can be frozen and stored. In fact, the dominant use for some types of oranges, such as Florida Valencias, is for juice. Although the orange is used primarily for its juice, there are useful by-products. These include the peel, which can be candied, dried, or made into marmalade, pectin, or orange oil, which is used for flavoring or perfumes. The pulp can also be used for livestock feed. The demand for orange juice in the United States has continued to increase. Recently, however, the use of chilled juice has grown more than the use of frozen orange juice.

After FCOJ leaves the processor's plant, it is sent to institutional distributors, to wholesale grocers, or to supermarket chains.

Price Determinants

While the price of any commodity is affected by both supply and demand, supply has the dominant influence on orange and orange juice prices. And, as indicated, weather has a greater effect on the supply of oranges and orange juice than on the supply of almost any other commodity. Winter freezes, particularly during the freeze-scare period, usually considered to be from late November to mid-February in Florida, affect the supply of oranges and the price of FCOJ significantly. Even threatened or rumored freezes may have short-run effects on FCOJ prices.

In addition to warmth, an orange tree requires considerable moisture, and in some areas irrigation is required. Drought during blooming is especially serious. Trees might also suffer from inadequately drained soil, too much irrigation, and insects. Sudden heat waves can cause young fruit to fall off the trees. Strong winds may also prove dangerous.

In extremely warm areas oranges may ripen during the fall and winter months, but in cooler climates they ripen in the spring or summer a year after blooming. Some ripen early, some in midseason, and some late. In California, they ripen throughout the year.

Current supply is affected by the amount of frozen orange juice concentrate produced (the pack), movement to retail outlets, and stocks on hand. Juice available for concentrates is affected by variables such as the number of trees, the amount of fruit per tree, the size of the oranges, and drop.

On the demand side, the size of the population and the income level affect prices. Because the demand for FCOJ is more elastic with respect to price than the demand for many other commodities, a change in price will affect the level of demand.

Up through the 1970s, the Florida supply of FCOJ was the only supply factor in determining prices. However, with increasing Brazilian production and the four severe freezes during the early 1980s, imports of Brazilian oranges and FCOJ have begun to influence U.S. prices. Large imports during these four freezes mitigated the degree of price increases. Continued and increased imports of Brazilian oranges and FCOJ may not only make inroads in Florida production but also, to some extent, stabilize prices during Florida freezes. Overall, unlike the market for most other commodities, the market for FCOJ has been primarily a domestic U.S. market. However, it appears that the U.S. FCOJ market will become a more international market in the future, with significant imports.

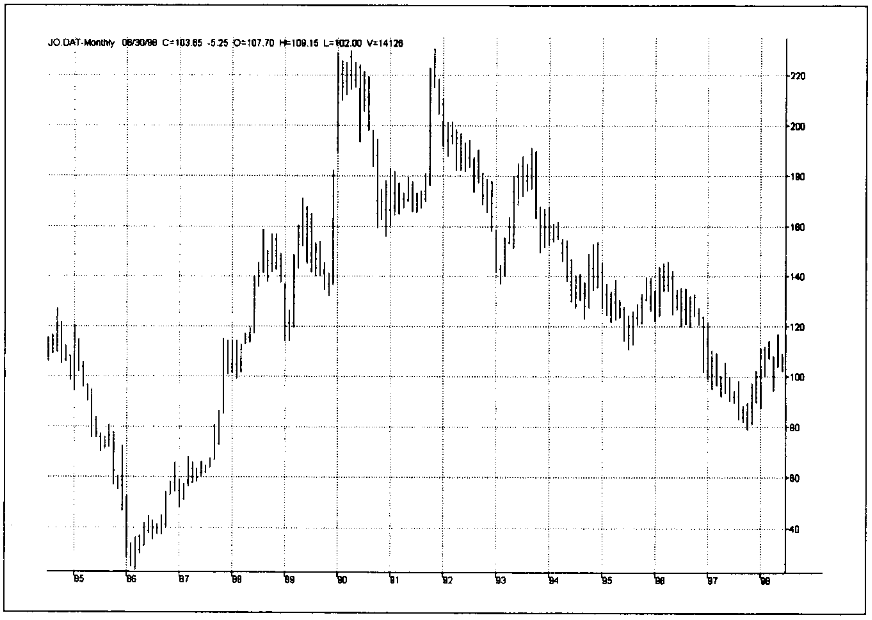
Figure 21-6 shows the significant volatility of FCOJ future prices, as traded on the New York Cotton Exchange.

Futures Contracts

A futures contract on FCOJ began to be traded at the New York Cotton Exchange during 1966. The contract was developed with considerable sup-

FIGURE 21–6

Orange juice futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research.



port from the growers, the processors, and the canners of concentrate, and the contract proved immediately successful. The open interest exceeded 5000 contracts within 18 months, and trading volume was heavy.

The contract is based on the delivery of 15,000 pounds of frozen orange juice concentrate from Florida warehouses licensed by the exchange. The minimum price change is 0.05 cent per pound, or $7.50 per contract. The trading months are January, March, May, July, September, and November. As indicated, the crop year for Florida oranges and the marketing year for FCOJ are considered to be from December 1 to November 30. Brazil's growing season is considered to begin on July 1.

Speculative Uses

Speculation in the FCOJ contract is done by both retail speculators and trade speculators in the orange and orange juice industries. Given the importance of weather to supply, much speculation is based on forecasts of weather and actual weather conditions. Cold, excess rain, and excess dryness all cause sharp changes in FCOJ futures prices. Trade speculators include orange growers and the cash market fruit dealers (the "bird dogs"); the latter usually constantly vary their hedges on the basis of changing conditions.

Although there is a crop year in FCOJ and intracontract crop spreads can be done, they are not a common type of speculative trade.

Sources of Information

Given the importance of Florida in the production of oranges, publications from Florida, as well as from the USDA, are very important sources of information on oranges and FCOJ.

The USDA *Fruit Situation* report is issued four times a year (in February, July, September, and November); it summarizes the available supply and consumption figures and provides analysis. The USDA also publishes the annual *Summary of Citrus Fruit Industry* during October; among other things, this publication estimates the orange crop for the following season. The USDA also issues *Monthly Cold Storage Reports* (released during the middle of each month), which indicates the frozen orange juice stocks at the beginning of each month. Finally, the USDA issues the *Crop Production Report* six times a year; this report summarizes the conditions of Florida oranges and citrus crops.

Weekly Statistics, from the Florida Canners Association, provides weekly statistics on carry-over, pack, movement, goods on hand, and utilization for Florida fruits and fruit juices. The Florida Citrus Manual regularly publishes the *Triangle* and also a weekly summary of citrus statistics.

The Florida Crop and Livestock Reporting Service of the Florida Department of Agriculture publishes the annual *Citrus Summary,* which provides data on acreage, production, utilization, prices, and shipments of citrus fruits from all states. The reporting service also provides other statistical information on a more frequent basis. The Florida Citrus Processors Association provides movement data each Thursday.

Finally, *Traders Position,* released by the New York Cotton Exchange each Tuesday, provides the positions of traders during the previous week.

Notes from a Trader—Orange Juice

Trading the frozen orange juice contract is attractive for those who find sudden significant price changes appealing. For those whose pocketbooks or nerve cannot stand sudden adversity of possibly considerable magnitude, other markets may provide better trading vehicles.

With all the factors affecting orange juice prices, one factor dominates: Florida weather. Reports of cold waves, drought, or untimely rainfall can affect prices drastically. The short history of the orange juice futures market, the absence of other similar futures markets, and the relatively recent history of the orange juice concentrate industry do not present the fundamentalist with nearly as much basic information as is available for other commodities.

The trader should beware of judging demand by the size of the concentrate movement immediately after a price increase. Chain stores and other major buyers are normally offered a brief period of price protection during which they can build stocks—which they naturally do whenever a significant price increase is announced.

LUMBER

Introduction

The increasing demand for new houses in the United States since World War II and the resulting general increase in construction have been the major reasons for the phenomenal growth of the softwood industry in the United States. Wood is divided into two categories: hardwood and softwood. There are two ways to distinguish these two types. First, relatively soft woods with an open grain are classified as softwoods, while relatively hard woods with a closed grain are classified as hardwoods. Second, softwoods have exposed seeds, usually in the form of cones (thus, they are called "conifers")—they are also called "evergreens," since they retain their needles throughout the year. On the other hand, hardwoods conceal their seeds in a fruit. They also have leaves and are typically deciduous; that is, they lose their leaves in the fall. Only softwood is considered in this section because it is the type of wood mainly used in construction and on which futures contracts have been based.

The lumber industry is distributed widely throughout the United States—all 50 states engage in lumber production. About 80 percent of all lumber produced is softwood. The western states, mainly Oregon, Washington, and northern California, produce about 65 percent of the softwood, with the southern states, mainly eastern Texas, southeastern Oklahoma, and all states east to the Atlantic Coast and south of the Ohio River, producing about 25 percent. Essentially, all the hardwood is produced in the eastern states.

While lumber imports have increased to over 30 percent of U.S. consumption, virtually all of these imports are from Canada, mainly imports of softwoods such as Douglas fir, western pine, and cedar. Most Canadian softwood is produced in British Columbia. The United States also exports a modest amount of lumber. The United States imports very little Canadian plywood, compared with lumber imports, due to a U.S. duty and different grading systems. Thus, the lumber industry, unlike most of the other commodity industries considered, is predominantly a domestic industry, with the exception of participation by Canada. Africa, Asia (with the possible exception of Japan), and Europe are not important participants in the U.S. lumber industry.

Because the only currently active futures contract is based on lumber (two-by-fours) and there is no futures contract based on plywood, the emphasis in this chapter is on lumber. Plywood, however, is considered in less detail.

Supply

There are several steps in the production of lumber and plywood. The first is the logging, or harvesting, of the timber—that is, cutting down the tree and transporting it to the mill. The logging may be done by small independent concerns, by companies that also include the mill, or by large, integrated lumber companies. But in any case, the logging is, to a large extent, done on land not owned by the logger.

The ownership of commercial forestland is divided between lumber firms, private individuals, local and state governments, and the federal government. In the United States, over half of the softwood timber is publicly owned. Loggers bid competitively for "stumpage" on both government-owned and privately owned lands. Stumpage costs are important costs in the production of lumber and plywood.

The trees are felled with chain saws or mobile machines, skidded to a collection point, and transported to a mill by water or truck. Due to rugged terrain, it may be difficult to transport the logs. Bad weather, particularly rain (which makes the ground muddy) and fire (caused by dry weather), can make it even more difficult. Independent loggers sell their logs to mills at market prices, and their transportation route depends on the mill to which they have sold the logs, whereas integrated companies (those which include both loggers and mills) have regular transportation routes.

The second part of the lumber industry is the sawmill. At the mill, the logs are either stored in water or stored in open air—if stored in open air, they are sprayed to protect them from insects and to prevent moisture loss. In addition, the logs are debarked—the bark chips are sold for various uses. At this point, the logs are either sawed for lumber production or peeled for plywood production. Logs used for plywood (veneer logs) sell at premiums of approximately 60 percent to logs used for lumber (sawlogs).

The sawlogs are sawed to size depending on the size of the logs; passed through an edger, which evens the edges; and brought to a trimmer, which trims the ends. The lumber is then sorted by grade and size and then, in some cases, seasoned—that is, dried by either kiln or air to remove the moisture. Over half the lumber is kiln-dried, only a small amount is air-dried, and the remainder is sold green. Finally, the lumber is planed to make the surfaces smooth. Then, the lumber is prepared for shipping by being banded (with a steel band), wrapped (with a plastic sheet or a waterproof paper sheet), and loaded onto railroad cars. Wholesalers then play an important part in marketing the lumber, at times selling the lumber in transit from the mills.

Plywood is produced in a very different manner. The logs are cut into 8-foot 4-inch peeler blocks, which are subjected to hot water to make them easy to peel. The blocks are then peeled while being rotated on a lathe—a large stationary knife peels off a ribbon of wood known as veneer. The veneer is then cut into sheets and dried. Several veneer sheets are stacked (with the grains of adjacent sheets perpendicular to one another), glued, and then subjected to heat and pressure. The plywood, which is very strong for its weight, is then graded for smoothness and for knotholes and other defects. Plywood is also typically transported by rail—except in the south, where it is usually transported by truck.

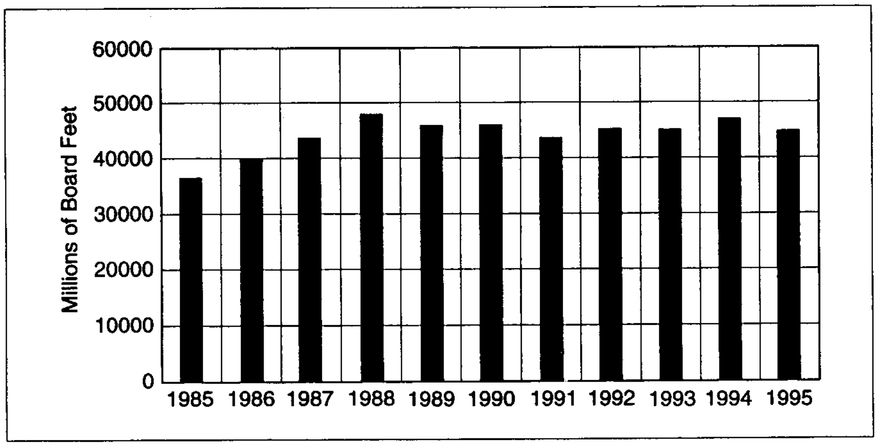
Table 21-15 provides some statistics regarding lumber in the United States. Table 21-16 shows information on world production.

Demand

The major demand for softwood lumber comes from five broad categories. The uses, with their recent percentage of all U.S. softwood consumption in

TABLE 21-15

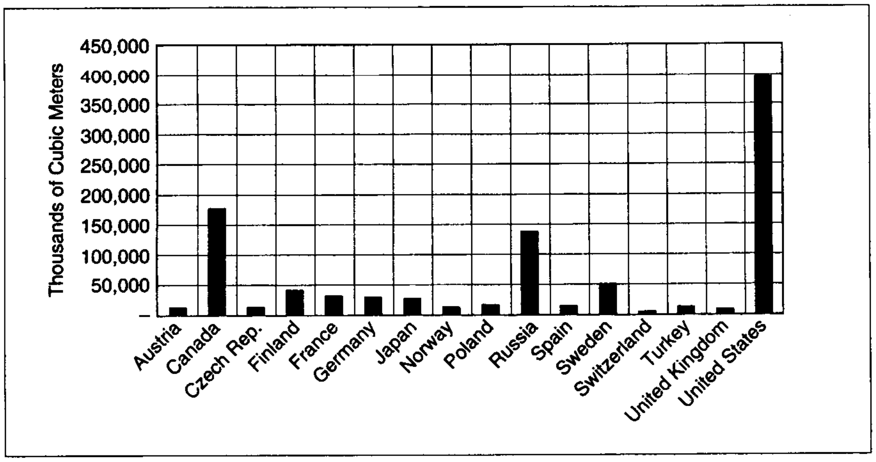
Lumber Production in the United States (Softwood)



Source: American Forest and Paper Association.

TABLE 21-16

World Production of Industrial Roundwood, 1993



Source: Food and Agricultural Organization of the United Nations.

parentheses, are residential construction (40 percent); nonresidential construction (14 percent); repairs and remodeling (29 percent); and materials handling and other uses (3 percent), with the latter including furniture, other manufactured products, railroad rails, and exports.

In residential construction, which represents the largest use of softwood, the lumber is used for framing the structure (that is, forming the skeleton of the structure), and the plywood is used for sheathing (that is, providing the initial cover of the structure). The construction of single-family residential dwellings is critical to the demand for lumber because each single-family dwelling uses twice as much or more lumber and plywood as a multifamily dwelling. Often steel or metal studs are substituted for lumber in multifamily dwellings.

Price Determinants

The determinants of the price of lumber relate mainly to supply and demand factors—government policies have only a minor effect on the lumber industry. On the supply side, consider the costs of production. The major costs of lumber production are raw material costs, transportation costs, and labor costs. Stumpage costs are the major raw material costs. Stumpage costs depend on the willingness of commercial forestland owners, including the government, to lease the land and the price they charge. As indicated, veneer logs are considerably more expensive than sawlogs. There are two phases of transportation and the transportation costs. The first phase is transporting the logs from where they are felled to the mill. Weather may affect the cost of this phase of transportation. Rain or melting snow, particularly during the spring, can cause mud. On the other hand, dry weather, particularly during the summer, can cause fires or threats of fire, which may cause logging to stop.

The second phase is transportation from the mill to the market. Since most lumber and plywood is transported by rail, railroad strikes may prevent delivery of the lumber or plywood to the market—such strikes cause lumber prices to rise, at least in consumption areas away from the mills. Railcar shortages will have an effect similar to that of railroad strikes. Reductions in the level of mill operations due to mill strikes or a shortage of logs also tend to raise lumber prices. Stocks of lumber and plywood in consumption areas or at the sawmills will alleviate these supply problems for a short time, if transportation from the mills to the consumption areas is not interrupted.

On the demand side, while lumber and plywood have many uses, residential construction is the dominant use. Thus, housing starts, published monthly by the U.S. Department of Commerce, are, on a seasonally adjusted annual basis, an important indication of lumber and plywood demand. Housing authorizations and housing competitions are also closely watched indicators of lumber and plywood demand. The housing cycle in the United States is very volatile, and this volatility, in turn, can cause significant volatility in the lumber-producing industry.

Given the sensitivity of the demand for housing to mortgage interest rates, the level of interest rates and the posture of monetary policy are watched as leading indicators of the demand for lumber and plywood. Lumber prices, on the demand side, may also be affected by substitutes. Steel or aluminum studs have been used to replace lumber in construction. Also, plastics and hybrids have replaced lumber in some decorative rather than structural applications, and plastics have been used for applications such as furniture shutters and millwork. The increased use of such competitive materials is likely to continue.

The U.S. dollar–Canadian dollar exchange rate affects the demand for lumber. A stronger U.S. dollar or a weaker Canadian dollar leads to greater imports from Canada and less U.S. production. Government programs, both direct and indirect, also affect the demand for lumber. Obviously, programs that support housing, such as programs sponsored by GNMA, FHA, and VA, and policies that affect interest rate, such as monetary policy, affect the demand for lumber and plywood indirectly. Timber management programs run by the Forest Service of the U.S. Department of Agriculture affect lumber supply and prices more directly. But government programs have not significantly affected the lumber industry directly by setting price levels as they have done in the grain and cotton industries.

Futures Contracts

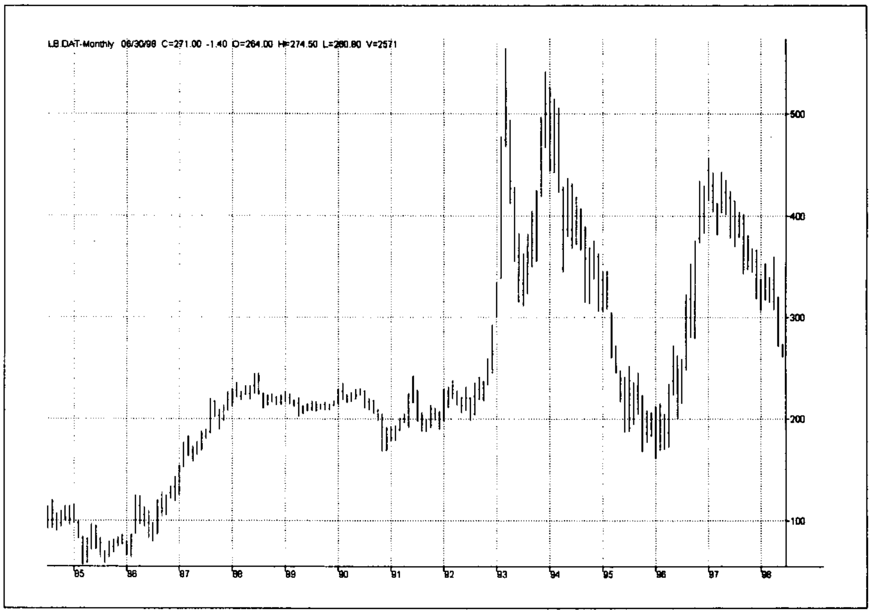
Currently, the most active futures contract based on wood products is the contract on random-length lumber at the Chicago Mercantile Exchange. It was initiated in 1969 and has undergone several changes since then. The futures contract on random-length lumber is based on the delivery of 80,000 board feet of two-by-fours of random lengths—the lengths vary from 8 feet to 20 feet. (The exchange provides a schedule of the acceptable range of percentages for deliveries of each length from 8 feet to 20 feet.)

The following species of softwoods are deliverable: alpine fir, Engelmann spruce, hem-fir, lodgepole pine, and spruce-pine-fir. The deliverable grades are "construction and standard" for the "light framing" classification and No. 1 and No. 2 for the "structural light framing" classification, and the lower grades—standard and No. 2—may not be more than one-half of the delivery unit. Delivery can be made via two railroad flatcars from the Canadian provinces of British Columbia and Alberta and the states of Washington, Oregon, California, Montana, Idaho, Nevada, and Wyoming. The delivery months are January, March, May, July, September, and November. The minimum price fluctuation is 10 cents per board foot, or $8 per contract. The recent price history of random-length lumber is shown as Figure 21-7.

Because delivery of the lumber is via railroad cars, lumber delivered on one futures contract cannot be redelivered on a contract of a later

FIGURE 21–7

Lumber futures, 1984–1997. Chart created using Trade Station 4.0 by Omega Research, Inc.



month. For this reason, the prices of various contract months are not related on a cash-and-carry basis; that is, they do not differ strictly by the carry cost between the two months. Thus, intracontract spreads have considerable volatility and risk.

The Chicago Mercantile Exchange began trading futures and options on oriented strand board (OSB) on November 8, 1996. OSB is an engineered wood product made by processing small-diameter, fast-growing trees into strands which are bonded together with waterproof resins. In many areas of North America, OSB has virtually replaced plywood in residential construction.[2]

CME futures are based on 100,000 square feet of OSB. The minimum tick size is $0.10 per 1000 feet, or $10. The futures price history of OSB is shown as Figure 21-8.

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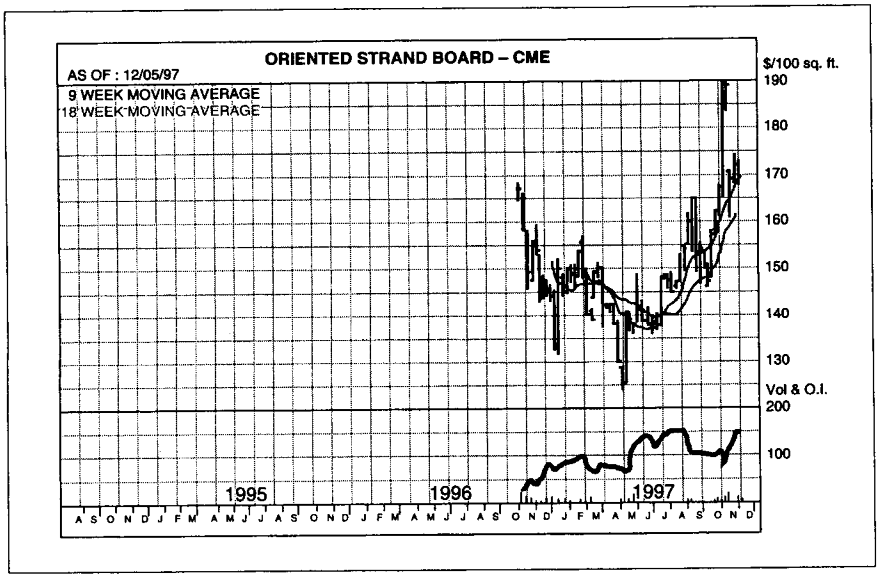
[2] Structural Board Association; Chicago Mercantile Exchange.

FIGURE 21-8

OSB futures.



Source: Chicago Mercantile Exchange.

Speculative Uses

Speculators trade lumber futures on the basis of the price determinants discussed above. Housing starts are used significantly as a basis of speculation. Strikes, prospective strikes, or even rumored strikes, as well as weather, are also the basis for speculative activity.

As indicated above, because different contract months are not related by carry costs, intracontract spreads are very volatile and are frequently transacted by speculators. With the absence of plywood futures contracts, intercontract spreads are not common for lumber speculators.

Sources of Information

The Forest Service of the U.S. Department of Agriculture and the U.S. Department of Commerce provide several publications which are important for users of the lumber futures contract. Among them are:

Production, Prices, Employment and Trade in Pacific Northwest Forest Industries (quarterly)—USDA, Forest Service

Construction Activity (monthly)—Department of Commerce

Housing Starts (monthly)—Department of Commerce, Bureau of the Census

The Western Wood Products Association (WWPA), a trade association, provides subscribers with several publications which also provide data on and analysis of the lumber industry:

Barometer (weekly)
F.O.B. Price Summary Past Sales (monthly)
Western Lumber Facts (monthly)
Statistical Year Book

The Southern Pine Association and the American Plywood Association, both trade groups, also provide publications on lumber. Three other trade publications that provide valuable information are:

Random Lengths (weekly)
Crow's Weekly Letter (weekly)
F. W. Dodge Construction Bulletin (monthly)

The Chicago Mercantile Exchange provides statistics and other information on lumber and the lumber industry.

Notes from a Trader—Lumber

There are several interesting aspects of the lumber contract. The first is that it is primarily a domestic contract, with Canada being the only non-U.S. supplier on the contract. It is not necessary to analyze the weather and politics of a distant, obscure country in order to trade this contract. Second, this contract is more related to the financial markets, through mortgage interest rates, than the contract for any other commodity. Lumber prices tend to react inversely to interest rate changes. There is also very little intercontract spreading with any other commodity futures contract. And intracontract spreads tend to be very volatile due to the lack of a carry relationship between different contract months.

OTHER MARKETS

The other markets in the food and fibers group are butter (Figure 21-9), cheddar cheese (Figure 21-10), milk (Figure 21-11), and shrimp. Volume and open-interest figures in these markets have not yet reached levels high enough to attract substantial speculative activity. Thus, they will be examined only briefly.

Butter

Butter[3] is produced from cream and constitutes the third-highest use of milk, behind fluid milk and cheese. Butter is processed in several stages. Milk is first separated into its cream and skim fractions. The cream is then pasteurized and churned into butter, which is salted and ripened. On average, 100 pounds of milk will produce 4 pounds of butter. In 1996, butter production in the United States totaled 540,000 metric tons, a drop of 32,000 tons from 1995 and 79,000 tons below the 1992 record high. The reason for the sharp declines in recent years is the increased demand for spreads lower in calories and saturated fat.

The U.S. Department of Agriculture currently manages a price support program for cheddar cheese, nonfat dry milk (NDM), and butter. Under the program, the government (through the Commodity Credit Corporation, or CCC) serves as a "buyer of last resort" for these products. Pro-

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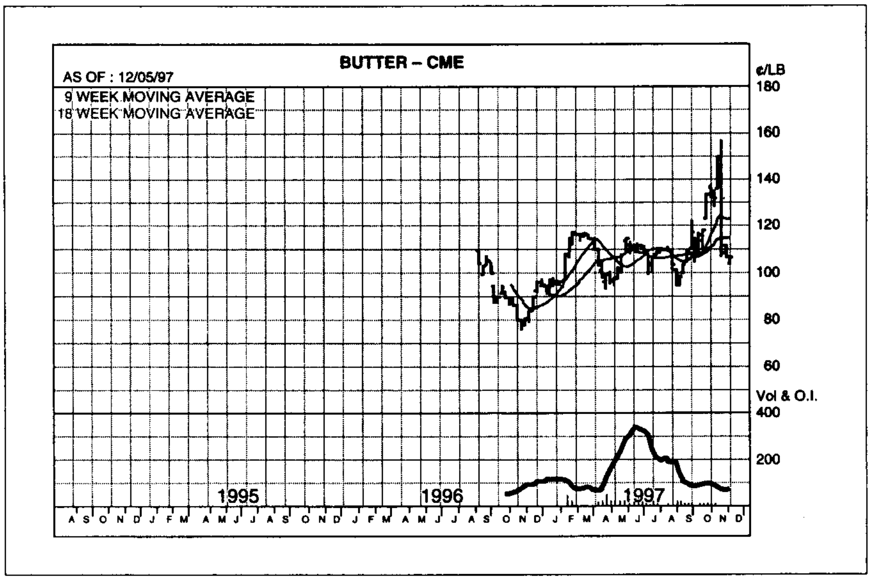
[3] Information on butter, milk, and cheddar cheese is courtesy of the Chicago Mercantile Exchange and the Coffee, Sugar, and Cocoa Exchanges.

FIGURE 21-9

Butter futures.



Source: Chicago Mercantile Exchange.

ducers can sell butter at any time to the CCC at the current support price, essentially forcing other buyers to at least match CCC price levels.

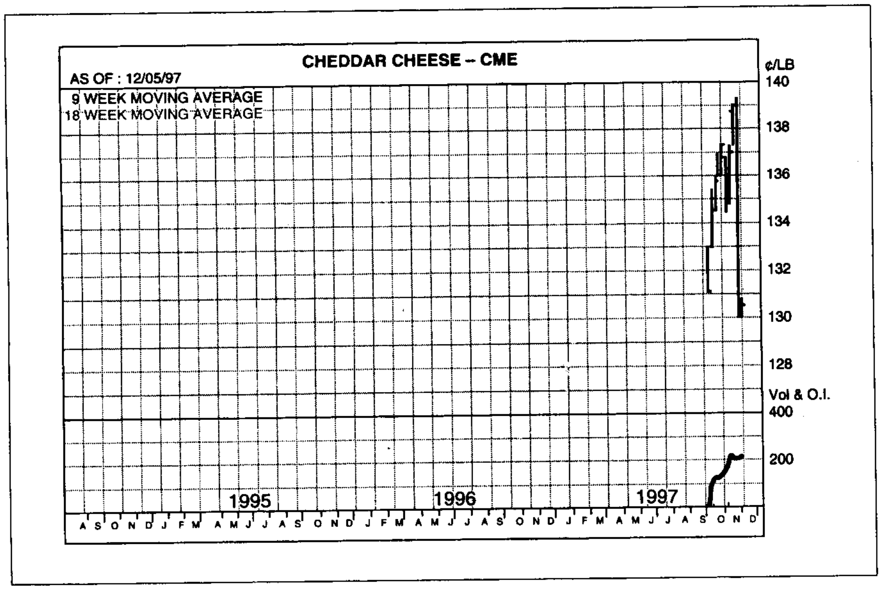
Cheddar Cheese

Cheddar cheese accounts for about one-third of all cheese produced in the United States. The cheddar cheese manufacturing process is relatively short; the cheese takes about 6 hours to make, and the cheese is edible within a few days. Often, cheddar is aged in cold storage warehouses to enhance the flavor. Aged cheddar is generally more valuable than freshly produced cheese.

Large corporations typically buy cheese under contractual arrangements with a floating price based on prices established in the cash market. Futures markets can provide a way to eliminate this price uncertainty. As the cheddar cheese market develops, cash market transactions can be based on futures prices. For example, a cheese retailer might contract to

FIGURE 21-10

Cheddar cheese futures.



Source: Chicago Mercantile Exchange.

buy 1 million pounds of cheddar over a 4-month period, delivered 250,000 pounds per month at 5 cents per pound "over the futures price." Such an arrangement would continue the producer's ability to deliver cheese at current market prices, but would enable either party in the transaction to "fix" the price by buying or selling futures.

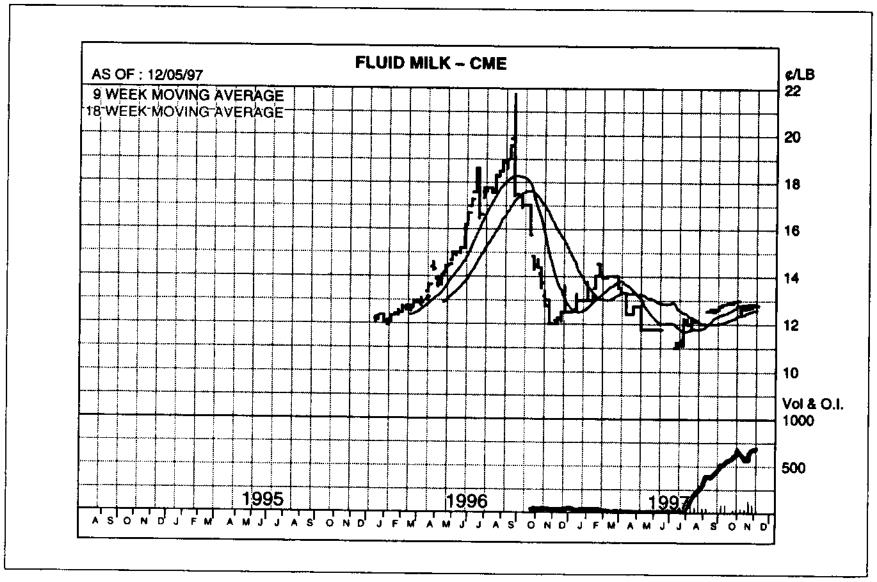
Milk

Milk either is used as a beverage or is employed in the manufacture of dairy products. Milk and cream sales account for one-third of U.S. production. Wisconsin and California produce about 30 percent of the nation's supply of milk. The United States is the world's largest producer of milk (about 18 percent), followed by Russia and India.

About 80 percent of grade A milk is marketed through the federal milk marketing order system. The minimum price for grade A (drinkable) milk is based on the basis formula price (bFP), which is calculated based

FIGURE 21-11

Fluid milk futures.



Source: Chicago Mercantile Exchange.

on the previous month's price for grade b milk (which is used in the manufacture of cheese and butter).

Nonfat dry milk (NDM) is a dehydrated form of milk from which the fat has been removed. NDM is a key ingredient in the bakery, confectionery, and pharmaceuticals industries. NDM can also be stored for up to 2 years.

Shrimp

The white shrimp and black tiger shrimp futures contracts began trading on the Minneapolis Grain Exchange in 1993 and 1994, respectively, spurred on by the rapid consumption pattern of seafood in the United States. White shrimp are raised in Ecuador and other Latin American countries. Black tiger shrimp are grown in Southeast Asia, with Thailand as the largest producer.[4]

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[4] Minneapolis Grain Exchange.

Notes from a Trader—Other Markets

The price history and volumes of the butter, cheese, milk, and shrimp markets are quite thin, with large price discrepancies and periods of nonliquidity. Although these markets are currently dominated by a few locals and an occasional hedger, a supply disruption or other circumstance could easily cause an explosive increase in popularity. Readers should be aware that most futures markets begin with little fanfare and even less activity.

22 CHAPTER

Index-based Futures Contracts

> "It takes three generations to make a gentleman, but only one lucky guess in the stock market."

This chapter examines those futures contracts which are based on a basket of underlying securities rather than a specific commodity. These contracts give investors the opportunity to take positions in markets (either long or short) more easily and cheaply than by buying all components of a broad-based index. For this reason, index-based futures have enjoyed great acceptance since their development in 1982. There are currently futures based on stock, bond, and commodity indices.

STOCK INDEX FUTURES

Introduction

The stock index futures markets began on February 24, 1982, with the listing of the Value Line Composite Index futures contract by the Kansas City Board of Trade. There are futures contracts on about 20 stock indices, as shown in Table 3-1.

Stock index futures contracts were not expected to be traded as early as 1982, if at all. The major reason for this caution was regulatory jurisdiction. The CFTC has regulatory jurisdiction over all futures contracts, and the SEC has jurisdiction over the stock market. There were, nevertheless, several questions with respect to whether the CFTC had exclusive jurisdiction over stock index futures contracts.

During December 1981, however, SEC Chairman John Shad and CFTC Chairman Philip Johnson negotiated their Shad/Johnson Agreement, according to which the CFTC had regulatory jurisdiction over all futures contracts based on broadly based stock indexes which were settled in cash. Soon after, the CFTC approved for trading contracts on the Kansas City Board of Trade (Value Line Composite Index futures), the Chicago Mercantile Exchange (S&P 500 Index futures), the New York Futures Exchange (New York Stock Exchange Composite Index futures), and the Chicago Board of Trade (Major Market Index futures).[1] Before the approval, however, the Fed, for the first time, became involved in setting margins on futures contracts. The Fed "induced" the exchanges to set margins on these contracts at a level where the dollar value was equal to 10 percent of the initial dollar value of the contracts.

The broad stock index futures contracts have grown quickly, have become an integral part of the nation's equity markets, and now have a greater dollar volume of trading than on the New York Stock Exchange, as shown in Figure 22-1.

Hedging Uses of Stock Index Futures

Commercial hedgers have used the stock index futures contracts for a variety of purposes. The hedge and investment uses of stock index futures contracts can be considered in the context of portfolio management strategies used by stock market professionals and concepts developed by academic and applied researchers of the stock market.

In general, there are two types of price risk in the stock market. The first type of risk relates to changes in the price level of the overall stock market—the level of the overall market is often measured by a broad index such as the S&P 500 Stock Index or the NYSE Composite Index. The second type of risk relates to changes in the prices of individual stocks relative to the price level of the overall stock market. The first type of price risk is called *market risk,* or *systematic risk,* and the second type is called

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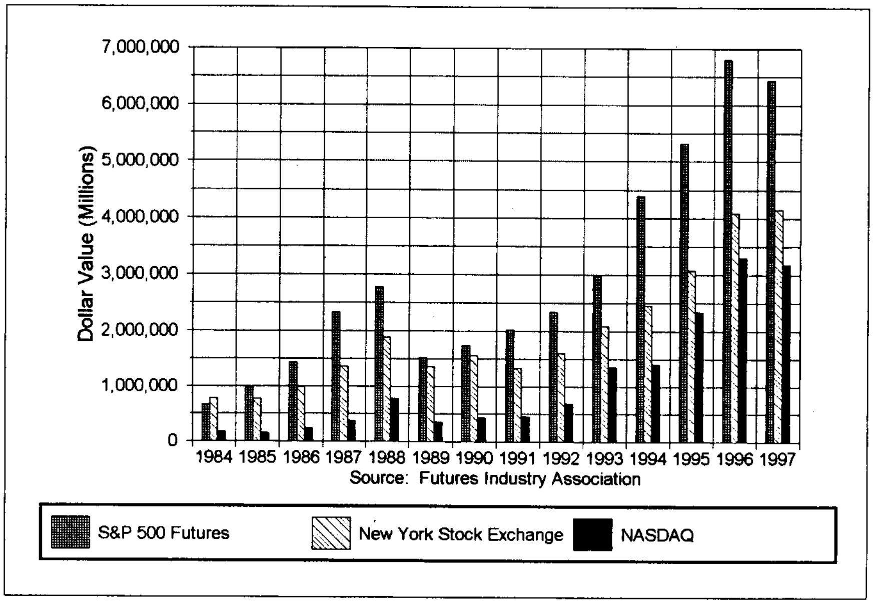
[1] Futures contracts for ten narrow industry stock indices and one mid-size index were submitted to the CFTC by the CBOT but never approved.

FIGURE 22-1

Dollar volume of trading, S&P 500.



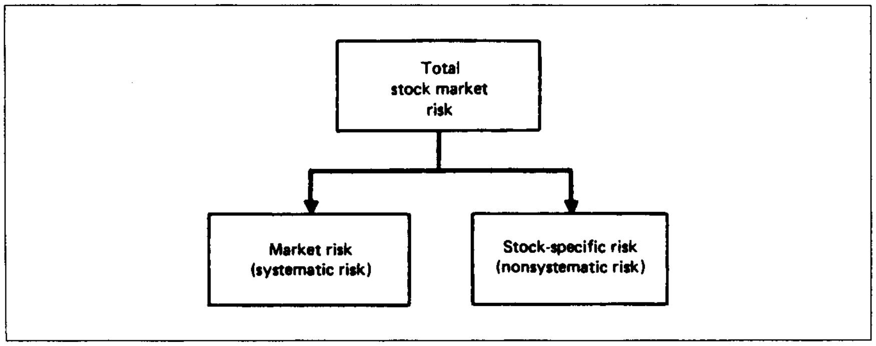
Source: Futures Industry Association.

stock-specific risk, or *nonsystematic risk.* Thus, overall stock market risk can be divided as shown in Exhibit 22-1.

With respect to market risk, the prices of some stocks are equally as volatile as the price level of the overall stock market, while the prices of other stocks are more or less volatile than the price level of the overall stock market. A statistic used in stock market analysis called the "beta coefficient" is used to measure the volatility of the price of a specific stock relative to the price volatility of the overall market (to be precise, the volatility of returns, which include dividends, is used rather than the volatility of prices). Very volatile stocks are often called "high-beta" stocks, and less volatile stocks are called "low-beta" stocks. For example, the price of a volatile stock may increase by 1½ percent when the price level of the overall market increases by 1 percent—such a stock has a beta of 1.5. The price of a low-beta stock, which is less volatile than the overall market, may, for example, increase by 0.5 percent when the price level of the overall market increases by 1 percent—such a stock has a beta of 0.5.

EXHIBIT 22–1

Stock Market Risk.



Two benchmarks for beta are the overall market, which is usually measured by the S&P 500 Stock Index or the NYSE Composite Index and which has a beta of 1.0, and a risk-free investment, such as a Treasury bill, which has a beta of zero.

Given the average volatility of a stock relative to the volatility of the market, the prices of some stocks track the trend of the market, and are adjusted for this average volatility very closely (are well "correlated" with the market), and the prices of others deviate frequently and substantially (are poorly correlated with the market). The former type tracks the market closely and has little stock-specific risk relative to the market; the latter type tracks the market poorly and has a high degree of stock-specific risk. So in considering the price behavior of individual stocks relative to the market, two characteristics must be studied: the average volatility of the stock relative to the volatility of the market (the beta) and how closely the price of the stock tracks the overall stock market when adjusted for the volatility (the correlation).

In general, portfolio managers can make their portfolios behave more like the overall market in terms of being more highly correlated with the market and having the same volatility as the market by diversifying their portfolios across many stocks. Obviously, if a portfolio had stocks representing every stock in an index, the behavior of the portfolio, in terms of both correlation and volatility, would agree with the behavior of the index. However, a high degree of correlation with the overall index and a similar volatility can be achieved with a stock portfolio in which the number of stocks is much smaller than the number in the index. For example, with respect to volatility, if a stock that increased in price by 1.5 percent and a stock that increased by 0.5 percent when the market increased by 1 percent were combined in equal amounts in a portfolio, the portfolio would move, on the average, by 1 percent when the market moved by 1 percent. Thus, by properly diversifying a portfolio among stocks, a portfolio manager can make the portfolio behave more like the index.

Portfolio managers, large and small, deal with stock-specific risk and market risk in two different ways. First, they reduce or eliminate the risk of having different volatilities than the market and stock-specific risk, as indicated above, by diversifying their portfolios across many stocks. Their portfolios then have only market risk, and the same degree of market risk as the overall market.

Portfolio managers deal with market risk, if at all, in a very different way. In times of expected bull markets—that is, in times of expected stock market price increases—they adjust their portfolios to include more volatile stocks so that the value of the portfolios increases more than the price level of the overall stock market.

On the other hand, in times of expected bear markets—that is, in times of expected stock market price decreases—they adjust their portfolios to include less volatile stocks so that the value of their portfolios decreases less than the price level of the overall stock market. In the limit, during times of expected bear markets, portfolio managers liquidate stocks and make less risky investments, such as in money market instruments. To the extent that they do this, they are, of course, not in the stock market at all.

Basically, then, portfolio managers implement two distinct types of strategies. The first strategy is "stock selection," that is, trying to select stocks to buy that will outperform the market and, to a lesser extent, trying to select specific stocks to short that will underperform the market. The second type of strategy is "market timing," that is, switching to very volatile stocks during times of expected bull markets and to low-volatility stocks or even money market instruments during times of expected bear markets. This market timing strategy is one form of "asset allocation," that is, shifting among equities, money, and bonds. Of course, market timing strategies may interfere with stock selection strategies or reduce the effectiveness of portfolio diversification.

There may, however, be strategic problems in both stock selection and market timing strategies using only the stock market. First, assume that investors wish to make a stock selection decision. They purchase a specific stock on the assumption that the price of that stock will increase because the stock will outperform the market. Assume that they are correct and that the stock does outperform the market. But assume that the overall market declines so that even though the stock outperforms the market, the price of the stock also declines. Thus, they are correct in their assessment of the stock along with the market, but they lose money.

Second, assume that investors wish to make a market timing investment based on the expectation of a rising market. To do so, they buy one or a few stocks. Assume that they are correct and that the stock market does increase. Assume also, however, that the stock or stocks they have purchased underperform the market and that the prices of the stocks decrease, even though the stock market increases. Thus, despite the fact that their assessment is correct and the stock market increases, they lose money.

There may, thus, be problems in implementing both stock selection and market timing strategies in the stock market. However, with stock index futures contracts, the problems in implementing both types of strategies can be reduced or eliminated.

Consider, first, the implementation of the stock selection strategy, that is, investors who wish to purchase a stock that they believe will outperform the market. To implement this strategy they could, under certain circumstances for some stocks, buy the stock and short the futures contract.[2] Then, given that they are correct and the stock does outperform the market, they will earn a net profit even if the market moves down. This occurs because any declines in the overall market generate profits on the short futures position which countervail the effect of the market on the price of the individual stock, leaving a net profit due to the stock outperforming the market. Thus, under these circumstances, investors can implement a stock selection strategy without having to be concerned with market, or systematic, risk. This strategy permits investors to buy superior stocks during the times of expected bear markets.[3]

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2. The effectiveness of this strategy depends on the degree of correlation of the price of the specific stock or stocks with the overall market.

3. The effectiveness of being able to implement this "hedged" stock selection strategy depends on the correlation of the price of the stock with the price of the overall market. The average volatility of the price of the specific stock relative to the overall market can be adjusted for in this type of strategy by varying the dollar value of the futures contract sold relative to the dollar value of the specific stock being hedged in a way that depends on the relative volatility. But if the correlation of the price of the stock with the market is weak, no adjustment can be made, and this type of hedge strategy is, thus, risky.

Second, consider the market timing decision. If investors thought the stock market was going to go up but were uncertain with respect to the price behavior of a specific stock or small group of stocks, they could buy a stock index futures contract, thus sharing in the price movement of the overall stock market without being affected by the price of any individual stock relative to the market.[4] Contrariwise, if investors thought the market was going down, they could sell stock index futures contracts. This is a common use of stock index futures for speculators.

Both individuals and stock market professionals can, thus, use stock index futures contracts to separate market risk from stock-specific risk and implement either a stock selection strategy or a market timing strategy without having unintended effects reduce the effectiveness of the strategy. In these cases, if investors are right in their assessment of an individual stock or the market, they profit.

Stock portfolios are more closely related to the overall market and, thus, have a higher component of systematic risk and a lower component of specific risk than individual stocks. Broad portfolios can, thus, be hedged more effectively than individual stocks—there would, of course, also be less chance of outperforming the market. The amount by which a stock outperforms, or underperforms, the market after an adjustment for volatility (or beta) is called the "alpha" of the stock. At the limit, a large, broad portfolio of stocks could be hedged essentially perfectly with broad stock index futures contracts. The return on such a hedged portfolio, however, would be equal to the short-term interest rate.

Because of the close correlation between the S&P 500 and NYSE Composite stock indexes and broad portfolios of stocks, portfolio managers use the stock index futures contracts based on these indexes to quickly increase and decrease their exposure to the stock market by buying and selling stock index futures contracts, respectively. The low transaction costs and high liquidity of the stock index futures markets make it advantageous to use the stock index futures markets for such asset allocations.

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[4] Due to the higher leverage of the futures contracts relative to purchasing stocks, the difference between what is desired to be invested in equities and what must be put up in margin for futures contracts could be put in Treasury bills to earn the risk-free interest rate. For example, if investors desire to invest $80,000 in "the market," they can buy stock index futures contracts which have a total market value of approximately $80,000 but require a margin deposit of approximately only $7000 and put the difference of $73,000 in risk-free Treasury bills.

Such hedging and investment techniques have been used by pension fund managers, block traders, stock underwriters, equity dealers, and specialists and other participants in the stock market.

Determinants of Stock Index Futures

There are two aspects to determining the prices of stock index futures contracts: determining the level of the index and determining the futures price given the index. The "basis" between the index and the futures price is defined as the futures price minus the index. The determinants of the basis are discussed under "Expectations," below. The determinants of the level of the index will be discussed first.

The determinants of stock market levels, as measured by stock indexes, are widely discussed and, at least by wise and honest individuals, not well understood. There are, however, two different approaches to providing the level of the stock market: technical and fundamental. And, in turn, there are two types of technical approaches. The first includes charting and several algorithms such as oscillators and relative strength indicators, which are discussed in Chapter 7. The second technical approach uses stock market indicators such as short interest, specialist short interest, advance/decline ratios, and odd lot buying and selling.

The fundamental approach could not even be summarized well here. One of the authors, however, co-authored an entire book on the stock market.[5] In addition, some of the major, commonly recognized fundamental determinants of the level of the stock market are listed and briefly discussed below.

Corporate Profits Higher corporate profits, which usually lead to higher dividends, typically lead to higher stock prices (are "bullish").

Interest Rates (Bill and Bond Prices) Higher interest rates cause profits and dividends to be discounted more in determining stock prices, and so higher interest rates typically lead to lower stock prices (are "bearish").[6]

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[5] See Richard J. Teweles and Edward S. Bradley, *The Stock Market*, 4th ed. (New York: John Wiley & Sons, 1982).

[6] A common model of stock prices is the dividend discount model, which says that the stock price is the discounted value of all future dividends. According to this model, an increase in profits and a decrease in interest rates both lead to an increase in stock prices.

Another way to express this relationship is that since high interest rates lead to low bond prices, and stock and bond prices should move together (since they are substitutes in many portfolios), high interest rates should lead to low stock prices. Stock and bond prices often, but not always, move together.

High corporate profits, which cause high stock prices, and high interest rates, which cause low stock prices, often occur together. Which of these two, then, dominates? There is not a general answer to this question. They have each had their days (and months and years). Determining which is dominant at a time is part of the art of predicting stock market levels.

Economic Conditions A strong economy usually causes high corporate profits and tends to increase stock prices for this reason. But a strong economy also often leads to high interest rates, which tend to cause stock prices to decrease.

Another way of summarizing the level of the overall stock market or the price of an individual stock is through the price-to-earnings ratio. The price of a stock (or the overall market) can be expressed as the price-to-earnings ratio multiplied by the earnings. Often factors which tend to make earnings increase, such as more favorable economic conditions, make the price-to-earnings ratio decrease because, for example, more favorable economic conditions cause interest rates to increase.

Expectations Expectations of almost any economic, financial, political, or social factor also affect the overall stock market. Thus, expectations can be said to determine which dominates, earnings or the price-to-earnings ratio. Often attributing stock price changes to expectations is an admission of almost complete ignorance about the cause of the changes.

Given the likely movements in a stock index underlying a futures contract, the relationship between the futures price and the index—that is, the basis—should be analyzed. There is a formula which gives the conceptual (theoretical) relationship between the index and the futures price, usually called the *fair value.* This formula says that the fair value of the futures price should equal the current level of the index plus the net cost of carrying the stocks representing the index until the maturity of the futures contract. This net carry cost equals the short-term financing cost, as measured by the Treasury bill of the appropriate maturity, minus the dividend yield of the index. This relationship can be represented by the following equation:

$$PF = I + FC - DY$$

where PF = futures price fair value
I = stock index
FC = financing cost
DY = dividend yield

Thus, if the current level of the index is 100, the annual financing cost is 12 percent, and the dividend yield is 8 percent, the fair value of the futures price with 3 months (one-fourth of a year) to maturity will be $PF = 100 + (\frac{1}{4})(100)(0.12 - 0.08) = 101$. Similarly, the fair value of the futures price with 6 months to maturity will be approximately 102 and the 9-month fair value of the futures price approximately 103.

The basis between the fair value of the futures price and the index, $PF - I$, thus, will equal the dollar value of the net carry cost from the date in question to the maturity of the futures contract. This basis obviously becomes zero as time passes because the dollar value of the net carry cost declines. At the maturity of the futures contract, the futures price equals the index—this is convergence.

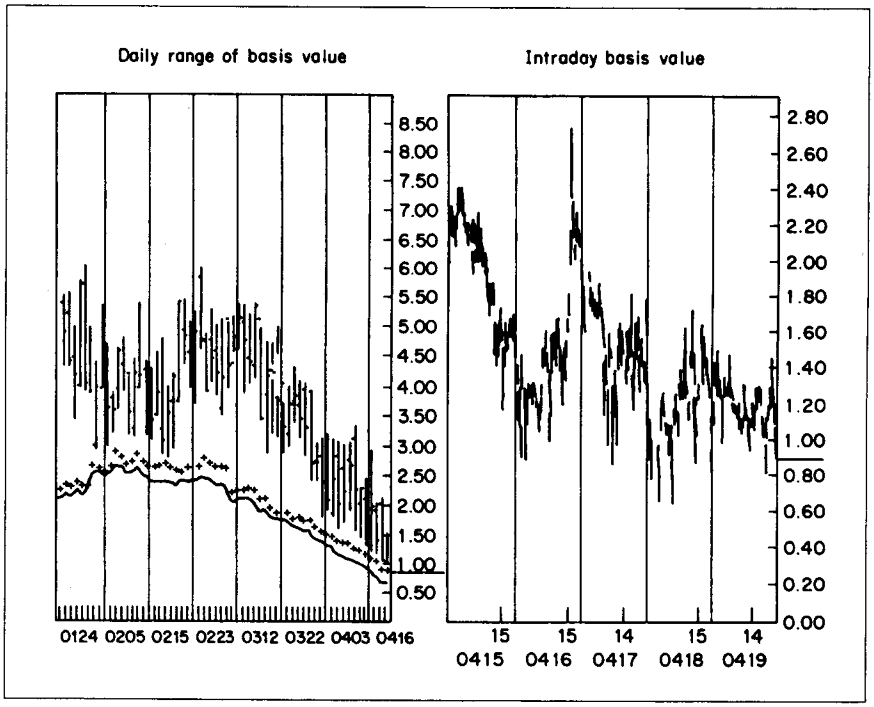
Even though the basis, $PF - I$, should, in concept, equal the net carry cost, $FC - DY$, called the basis "fair value," it often does not. The basis may actually be at a premium or a discount to fair value. Analysts watch this basis continuously. The spread varies significantly both on an intraday basis and on a day-to-day basis, as shown in Figure 22-2.

One reason why this basis is watched is for market information. Some assert that premiums provide a bullish signal and indicate that there will be a subsequent increase in the value of the index. Discounts, accordingly, provide a bearish signal. The basis for this assertion is that due to their greater liquidity, changes in the stock index futures contracts precede changes in the underlying market in either direction.

The second reason for watching the basis relates to the rate of return on a portfolio of stocks hedged with stock index futures contracts. Consider a broad portfolio of stocks hedged with one of the broad stock index (S&P 500 or NYSE Composite) futures contracts. Over the holding period of the short futures contract, the futures price will decline relative to the index by the initial spread, which is the short-term financing cost minus the dividend yield ($FC - DY$). Since the hedge consists of a short futures contract, this futures price decrease will cause a profit of equal amount ($FC - DY$) over the hedge. But by holding the stock portfolio, the holder also earns the dividend yield. Adding these two returns $[(FC - DY) + DY]$

FIGURE 22-2

S&P 500 index vs. June S&P 500 Future. Daily fair value estimate (T-bill—financed)—line; daily fair value estimate (CD-financed)— +.



gives the financing cost, as measured by an approximation of the Treasury bill rate.

Thus, the return to a broad stock portfolio perfectly hedged with stock index futures contracts is the Treasury bill rate. This seems appropriate—a risk-free return (the Treasury bill rate) for a risk-free investment (a hedged stock portfolio). Investors, small or large, who hedge their broad stock portfolios with stock index futures contracts will earn approximately the Treasury bill rate. This is the case, however, only if the futures contract is initially priced at fair value. If the basis is initially at a premium, the hedger is selling futures at a higher price and, thus, earns a profit higher than the Treasury bill rate on the hedge. Rates of return of over 20 percent have been available on this type of transaction. If the basis is initially at a discount, the return will be less than the Treasury bill rate. Any investors planning to hedge a stock portfolio should be aware of whether they are hedging when the market is at a premium or a discount.

Arbitrage

Arbitrageurs have been important participants in all futures markets, especially the interest rate markets. Arbitrageurs typically take one position in the cash market and an opposite or offsetting position in a futures market, with the expectation of profit based on a mispricing or other market inefficiency. This type of trading is usually a low-risk/low-return type of strategy, but most "arbs" employ the use of leverage to increase the size of their position and their potential profit. Arbitrage plays an important role in the futures market, not only by contributing order flow but also by providing markets with a "pricing mechanism" that keeps the futures market price in sync with the underlying cash market.

Arbitrage in the stock index futures markets is more complex than the arbitrage of other instruments such as Treasury bond futures; other futures contracts are based on specific, deliverable assets, whereas stock index futures are based on an index that is simply an average of many stock prices and has no existence of its own. For example, when constructing an arbitrage in the bond futures market, a trader can take either a long or short position in a specific bond that is deliverable on the contract against the opposite position in the futures contract. The cash market transaction is the purchase or sale of a specific Treasury bond. Even though several Treasury bonds are deliverable against the futures contract, at any time one bond is the "cheapest to deliver," and there is a fairly fixed price relationship among the other bonds. Thus, for bonds, taking a position in the cash market that perfectly offsets a futures position is quite easy.

For stock index futures, there is no specific deliverable. For example, the New York Stock Exchange Composite Index is a market-weighted average of approximately 1500 stocks. In order to have a perfect offsetting cash market position, an arb would have to construct a portfolio based on a correctly weighted average of these 1500 stocks. Another difficulty with this type of arbitrage is that, unlike Treasury bonds, for which interest is accrued on a daily basis, dividends on stocks are paid on a much less regular basis. This is important, because the dividends received on a model portfolio affect the return on the arbitrage.

Arbs have several methods to overcome these problems. First, the use of the List Order Processing Program (LIST) allows traders to simultaneously submit orders for many different stocks. Index arbitrage using this method has become the primary tool for arbs in the index futures markets. This technique is commonly known as *program trading.* Arbitrageurs also have the option of designing smaller portfolios that mimic the return of a given index. Such a strategy would reduce transaction costs and increase liquidity, but would also introduce basis risk if the mimicking portfolio does not exactly replicate the return of the index.[7]

Fortunately, predicting dividend payments on an index is much easier than on individual stocks. Several services make near-term predictions of the dividend payouts on the portfolios underlying the various stock indices.

Speculative Uses

The stock index futures markets have been actively used by both speculators and commercial hedgers. Recently, the S&P 500 futures contract has been the second largest futures contract in terms of trading volume, much of this activity being speculative. Speculators have accepted these markets for several reasons. One is the low margin, which may be high relative to other futures margins but is low relative to the stock market margin, which is 50 percent. The second is the lower transaction costs of the futures markets compared with the transaction costs of the stock market. The lower costs allow speculators to trade more actively.

It is also as easy to short futures contracts to implement a bearish stock market view as it is to go long on futures contracts to implement a bullish view, whereas in the stock market, it is more difficult to go short. For these reasons and others, speculators have also used these markets for long-term position trading. Figures 22-3 through 22-5 show price histories for the S&P 500, NYSE Composite, and Value Line Composite futures contracts.

As indicated by the above price charts, the stock market has experienced a prolonged period of appreciation. In response to these market conditions, the Chicago Mercantile Exchange reduced the size of its S&P 500 index futures contract by 50 percent effective November 1997 (the futures contract multiplier is $250 times the index versus the previous $500). The CME also launched e-mini S&P 500 futures, which are one-fifth the size of the S&P 500 contract. This contract is electronically traded—orders of up to 30 contracts are transacted though the CME's Globex system, versus

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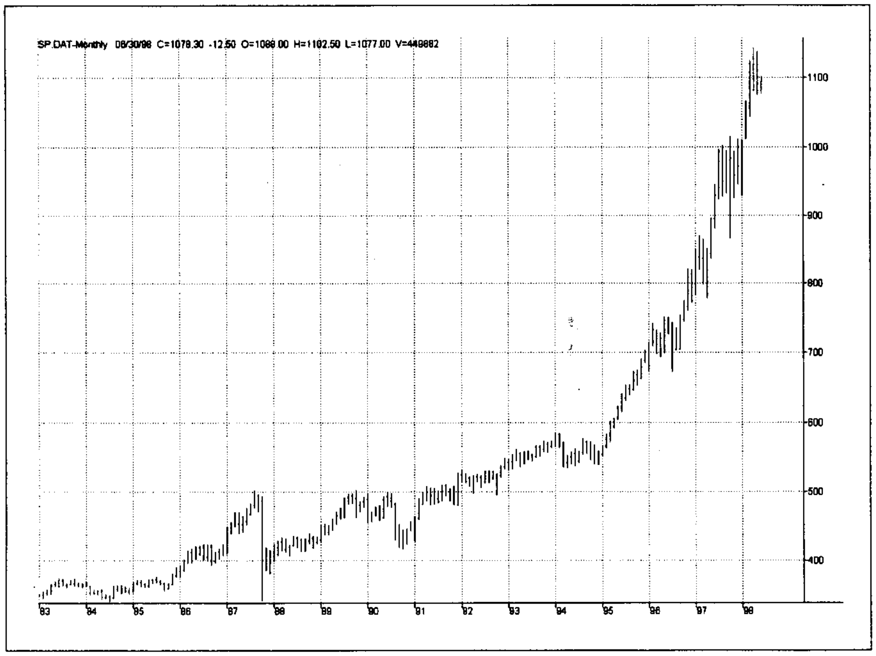
[7] Frank J. Fabozzi, and Gregory M. Kipnis, *Stock Index Futures* (Chicago: Dow Jones Irwin, 1984), p. 151.

FIGURE 22-3

S&P 500 index futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



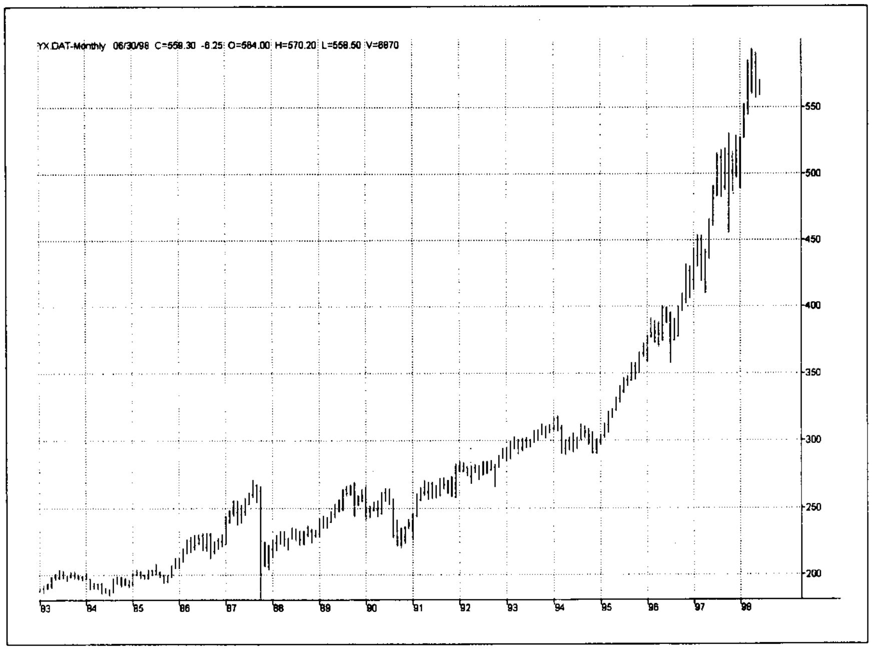
the traditional "open outcry" method that has been in use since the advent of futures exchanges. A number of foreign exchanges such as the Deutsche Borse in Frankfurt have experienced success via electronic trading, and the degree of acceptance of the e-mini contract is being closely watched by many in the futures industry. If this contract is able to sustain significant volume, other electronically traded futures products undoubtedly will be developed.

The Chicago Board of Trade also launched a new product for stock index traders. The Dow Jones Industrial Average (DJIA) futures contract is based on the most widely quoted and followed benchmark for the U.S. stock market. The price is quoted in points, with one point equal to a $10 move in the contract. The price history of the DJIA futures contract is shown as Figure 22-6.

Independent of attempts to predict the level of different stock market indexes, differences in the changes among the various stock indexes can be

FIGURE 22-4

New York Composite Index futures, 1984–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



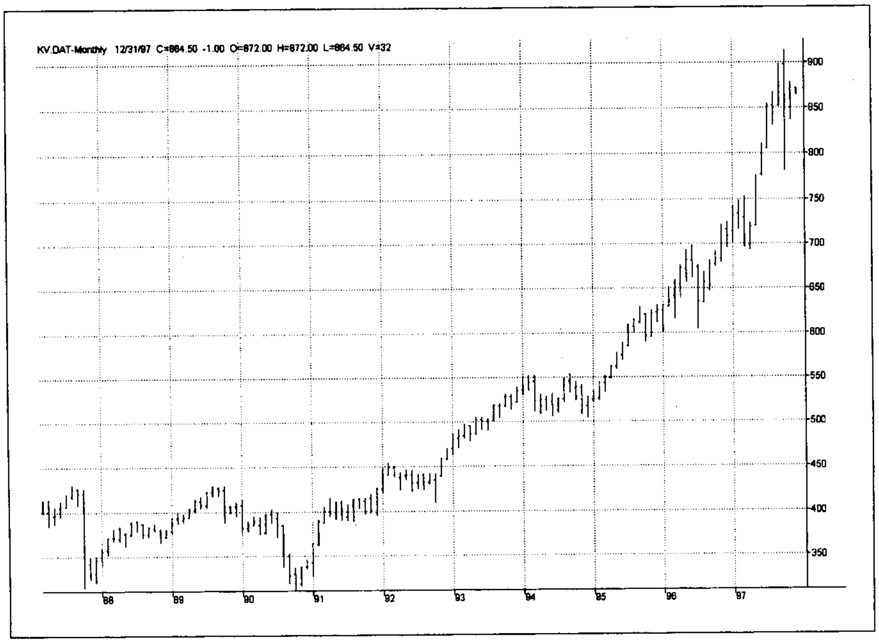
used as a basis for speculative strategies. The S&P 500 Stock Index and NYSE Composite Index are broad, capitalization-weighted indexes and can be considered as synonymous with "the market." However, as indicated above, the Value Line is more representative of small stocks. And for long periods of time small stocks, as a group, may have different price movements than the overall market or large stocks. In this regard, there is a much-discussed January effect, according to which small stocks outperform the overall market during January. This differential performance has occurred during most recent years.

The Major Market Index (MMI) is highly correlated with the Dow Jones Industrial Average—30 high-capitalization stocks. These few high-capitalization stocks at times also have price movements different from the overall market and small stocks.

Differentiating the various indexes can be used either for buying or selling outright the various contracts or for spreading between the con-

FIGURE 22-5

Value line futures, 1987–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



tracts. Day-to-day and month-to-month differences in the movements of these indexes are significant. For these reasons, the stock index futures markets have been actively used for spreading among markets.

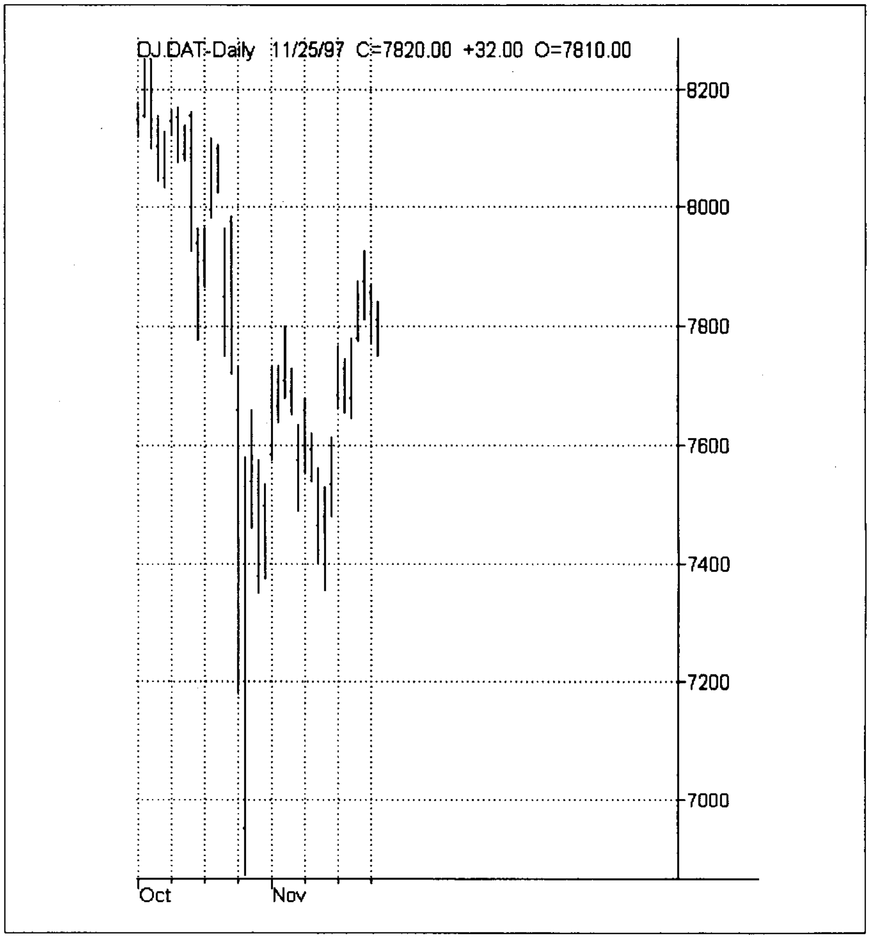
Due to the possibility of transacting in the overall stock market in one decision, the low transaction costs, low margins, liquidity, and the ease of shorting, stock index futures contracts have been used extensively by speculators for simply buying or selling in the market, spreading among various indexes, implementing various hedging strategies, and many other purposes. They also follow the stock index futures markets as indicators of the stock market itself.

Notes from a Trader—Stock Index Futures

The availability of stock index futures contracts has made it much easier to trade in the stock market due to their low transaction costs, including both commissions and bid-ask spreads, and the availability of instruments

FIGURE 22-6

Dow Jones Index futures. Chart created using TradeStation 4.0 by Omega Research, Inc.



based on "the stock market" by various measures rather than solely on individual stocks. Speculators may trade in the overall stock market via the S&P 500 and NYSE Composite Stock Index futures contracts, and they may trade the "high-cap" component of the stock market via the MMI contract and "small-cap" stocks via the Value Line contract.

The fundamental and technical methods used for analyzing individual stocks and the stock market have been adapted to the stock index futures markets. Some say that the advent of the stock index futures contracts has increased the use of technical methods in the stock market. Some traders use the degree of richness or cheapness of the contracts to make their buy-sell decisions, while others simply buy or sell on the basis of their evaluation of the underlying market, often thereby creating the richness or cheapness.

Most of the trading volume and open interest for these contracts is in the nearby contract month, indicating that most people are simply trading in the stock market with a short-term view, not spreading or investing on a long-term basis. The S&P 500 contract is extremely liquid, with very narrow bid-ask spreads. The other stock index futures contracts are also quite liquid.

BOND-INDEX FUTURES

There is currently only one bond-index future that is actively traded, the Municipal Bond Index contract. Other products currently in development are futures based on an index of developing-country debt (Brady bonds) and high-yield corporate bonds.

Municipal Bond Index Futures

Introduction Municipal bonds are long-term debt securities issued by municipalities, counties, and states to raise capital for local expenditure. The interest paid by these bonds is not subject to federal taxation. This serves two purposes—first, it allows state and local governments to keep their borrowing costs low; second, tax exemption provides a means of taxfree investment for retirees and other conservative investors. In 1985, the Chicago Board of Trade introduced a futures contract on municipal (or "muni") bonds to meet the hedging needs of those who trade in the municipal marketplace. The CBOT's primary reason for introducing the muni contract was that Treasury bond futures were ineffective hedging instruments for municipal rates. Though the Treasury bond and muni bond price movements appear highly correlated in Figure 22-7, long-term correlation studies have shown that the variability of Treasury bond futures explain only about 30 percent of the movement in municipal bond rates.[8]

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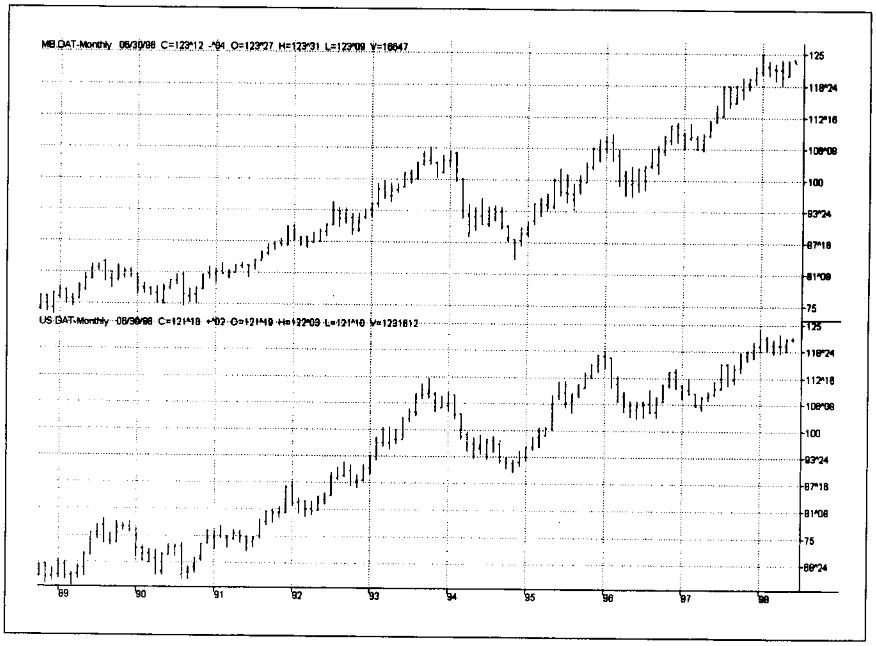
[8] Daniel R. Siegel, and Diane F. Siegel, *The Futures Market* (Chicago: Probus Publishing Company, 1990), p. 146.

FIGURE 22-7

Municipal Bond Index futures (top) and 30-yr bond futures (bottom), 1988–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



Unlike the Treasury bond contract, the muni bond contract is settled in cash. Its value is based on the *Bond Buyer 40 Index* to calculate the settlement price. The index was developed jointly by the investor publication *The Bond Buyer* and the CBOT specifically for the futures contract.

The Bond Buyer 40 Index is based on the prices of 40 municipal bonds. To be included in the index, a bond must satisfy the following criteria[9]:

1. It must have a minimum rating of A– by Standard and Poor's or A by Moody's.
2. It must have an outstanding face value of at least $50 million.
3. It must have a remaining maturity of at least 19 years.
4. It must be callable prior to maturity, with the first call in 7 of 16 years.

---

[9] M. Arak, P. Fischer, L. Goodman, and R. Darganini. "The Municipal Treasury Futures Spread." *The Journal of Futures Markets* 7 (1987), pp. 355–371.

5. It must have a fixed coupon and semiannual coupon payments.
6. It must be reoffered, out of syndicate, at a price of from $95 to $105 per $100 face value.
7. It must be publicly traded and include no extraordinary features.

The composition of the index changes on the fifteenth calendar day and last business day of each month. A bond will be dropped from the index and replaced by another eligible bond if there is a default on a bond, a bond drops below the required rating, or the bond is immediately callable.

Uses for the Muni Bond Contract Municipal bond futures can be used for hedging and arbitrage in the same manner as Treasury bond futures. The structure of the muni bond contract makes it a much more efficient instrument for hedging changes in municipal interest rates than Treasury debt, which explains the deep liquidity of the instrument. Some of the larger participants in the muni bond futures market are municipalities (the cities and counties that issue debt), underwriters (investment banks that distribute debt in the marketplace), and dealers (brokers that maintain inventories of muni bonds to sell to customers).

Muni bond contracts can also be used to speculate on changes in the federal tax structure. For instance, in 1986 and again in 1994, there was much uncertainty about whether Congress would retain the tax exemption for municipal bond income. As Figure 22-8 shows, this lead to dramatic movements in muni bond prices relative to Treasury bond prices.

Another widespread use of muni bond contracts is in the MOB (municipals-over-bonds) spread. This strategy consists of a position in muni bonds, with a corresponding opposite position in Treasury bonds. A popular strategy is to initiate a long-muni and short-bond spread during April, as the demand for municipal debt (because of its taxfree nature) is high relative to treasury debt demand, which is subject to state taxation.

COMMODITY-INDEXED FUTURES

Two futures contracts are currently based on a basket of commodities—the Commodity Research Bureau/Bridge (CRB) index futures and the Goldman Sachs Commodity Index (GSCI). The contracts were designed to represent broad trends in commodity prices. There are three major differences between the two indices: the commodity weighting in each index, the

FIGURE 22-7

Municipal Bond Index futures (top) and 30-yr bond futures (bottom), 1988–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.

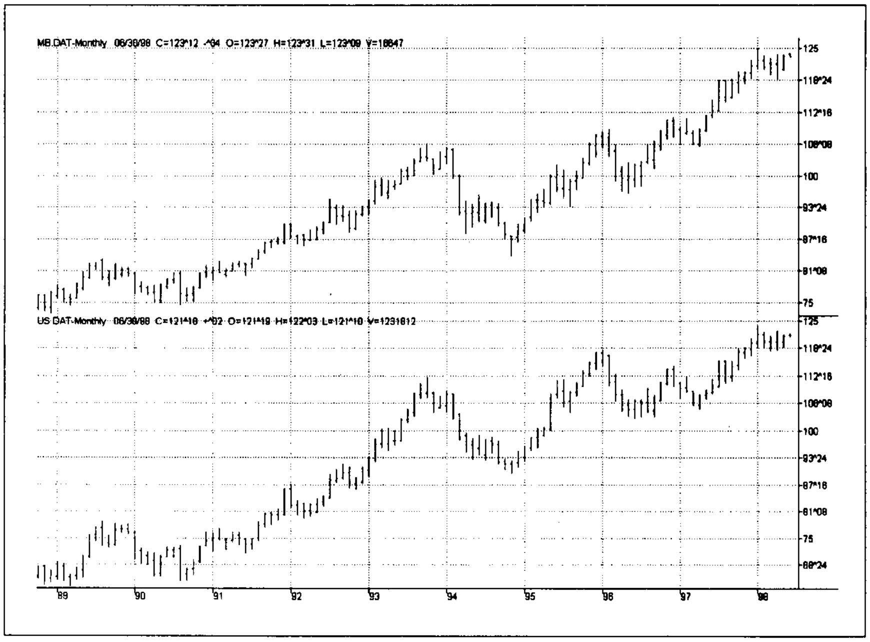


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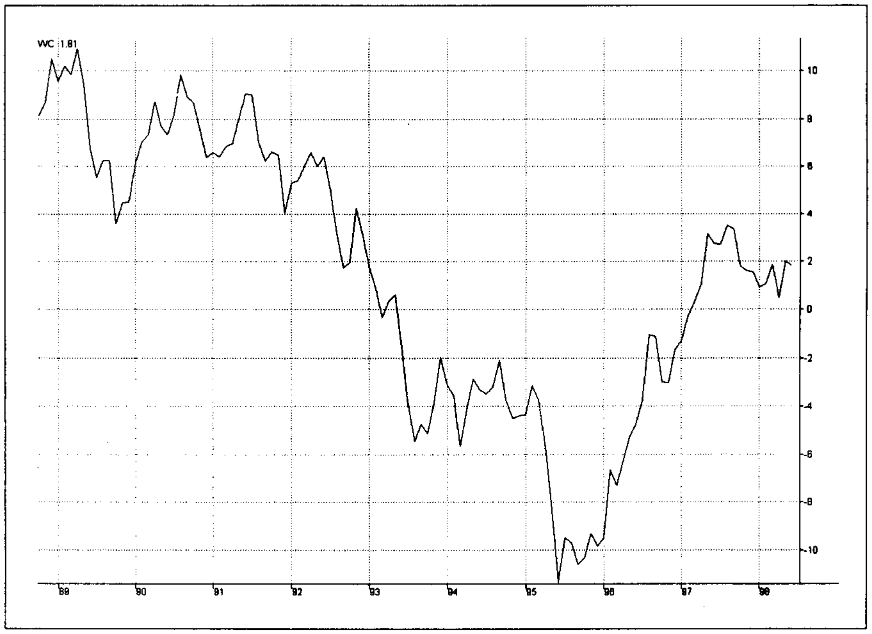
FIGURE 22-8

Municipal bond futures price/Treasury bond futures price, 1988–1997. Chart created using TradeStation 4.0 by Omega Research, Inc.



components of each index, and the liquidity of the futures contracts based on each index.

The *Commodity Research Bureau/Bridge Index* (formerly the Knight-Ridder Commodity Research Bureau Index) was first calculated by the Commodity Research Bureau using 1956 data and began trading on the New York Futures Exchange in 1986. The contract was the first of its kind to allow institutional and individual investors the opportunity to gain exposure to commodity prices with a simple transaction. The components of the CRB index are shown as Figure 22-9.

The CRB index can be viewed as a three-dimensional index. In addition to averaging prices across 17 commodities (two dimensions), the index also incorporates an average of prices *across time,* within each commodity. The calculation of the index follows a three-step process[10]:

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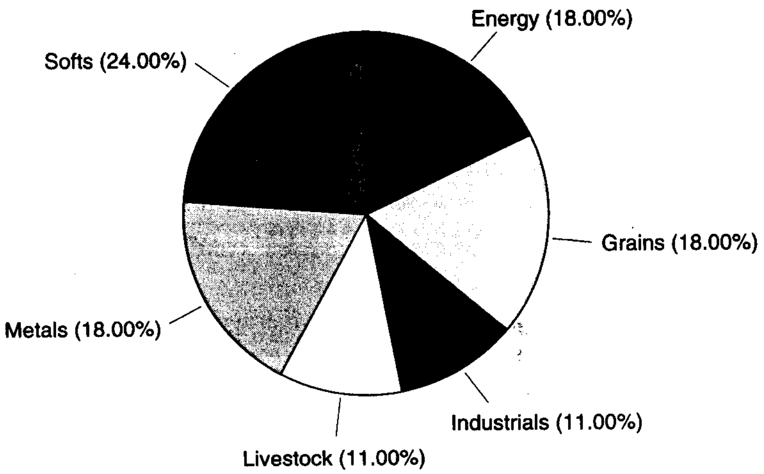
[10] Knight-Ridder Commodity Research Bureau, New York Cotton Exchange.

FIGURE 22-9

CRB Futures Price Index, component commodities by group.



Group	Components
Energy	Crude Oil, Heating Oil, Natural Gas
Grains	Corn, Soybeans, Wheat
Industrials	Copper, Cotton
Livestock	Live Cattle, Lean Hogs
Metals	Gold, Platinum, Silver
Softs	Cocoa, Coffee, Orange Juice, Sugar

Source: GSCI Institutional Manual, Chicago Mercantile Exchange, 1997.

1. Each of the Index's 17 component commodities is arithmetically averaged using the prices for all the future months which expire on or before the end of the sixth calendar month from the current date. Thus, the index extends between 6 and 7 months into the future. For example, the price for live cattle in August would be computed as

$$\text{Cattle average} = \frac{\text{Aug contract price} + \text{Oct contract price} + \text{December contract price}}{3}$$

2. The 17 component averages are then geometrically averaged by multiplying all the numbers together and taking the seventeenth root.

Geometric average =
(cattle average price × cocoa average price × . . . wheat average price)^{17}

3. The resulting value is divided by 30.7766, which is the 1967 base-year average for these 17 commodities. The result is then multiplied by an adjustment factor of 0.8486 to adjust for various changes in the makeup of the Index since its inception. Finally, that result if multiplied by 100 to convert the Index into percentage terms:

$$\text{KR-CRB Index} = \frac{\text{current geometric average}}{\text{1967 geometric average (30.7766)}} \times 0.8486 \times 100$$

Advantages of the CRB Index

For an investor keen on participating in broad moves in commodity prices, the CRB index futures contract offers many advantages. First, the index is equally weighted among all commodities, so that an adverse move in one sector will not cause an unusually large drop in CRB index values. Also, the CRB index's use of deferred contracts and the geometric averaging technique used to calculate index values tends to dampen the price movement of the index, creating a relatively smooth stream of prices. The result is a contract that allows investors to speculate (or hedge) on the movements of raw materials prices without an undue weighting on any commodity group.

The Goldman Sachs Commodity Index

The Goldman Sachs Commodity Index (GSCI) represents a different approach to the construction of a commodity index of futures prices.[11] Unlike the CRB index, which gives equal weighting to all commodities, the quantity of each commodity in the GSCI is determined by the average quantity of production in the last 5 years of available data. This "production weighting" concept allows each commodity to be weighted by the

---

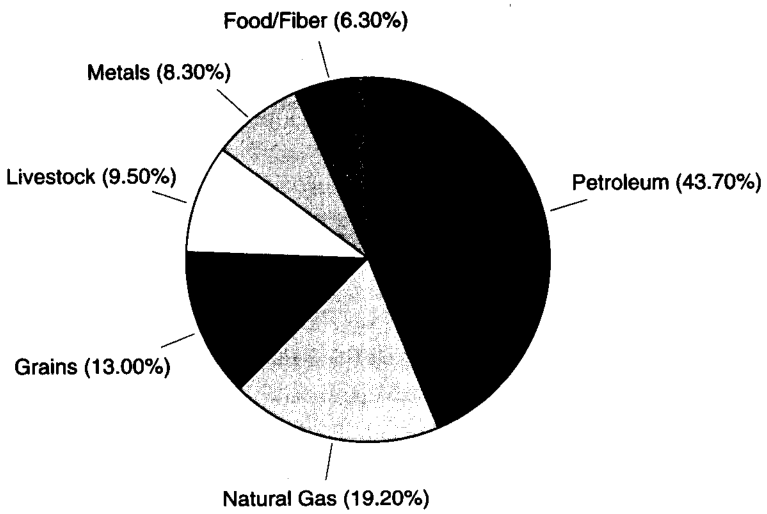
[11] Chicago Mercantile Exchange, *GSCI Futures and Options Institutional Manual,* 1997.

amount of capital dedicated to holding that commodity, much as equity market indices weight stocks by market capitalization.

The commodity markets included in the index must meet strict liquidity guidelines; trading volume must exceed 750,000 contracts in the previous 12-month sample period (May through April), and the volume of contracts must represent at least 33 percent of a 5-year average of world physical production for the commodity. Twenty-two markets are currently included in the GSCI; they are shown in Figure 22-10.

FIGURE 22-10

CRB Futures Price Index, component commodities by group.



Group	Components
Petroleum	Crude Oil, Unleaded Gasoline, Natural Gas
Natural Gas	Natural Gas
Grains	Wheat, Corn, Soybeans
Livestock	Live Cattle, Lean Hogs
Metals	Gold, Platinum, Silver, Aluminum, Copper, Zinc, Nickel, Lead, Tin
Food/Fiber	Cocoa, Coffee, Orange Juice, Sugar

Source: Knight-Ridder Commodity Research Bureau, New York Cotton Exchange.

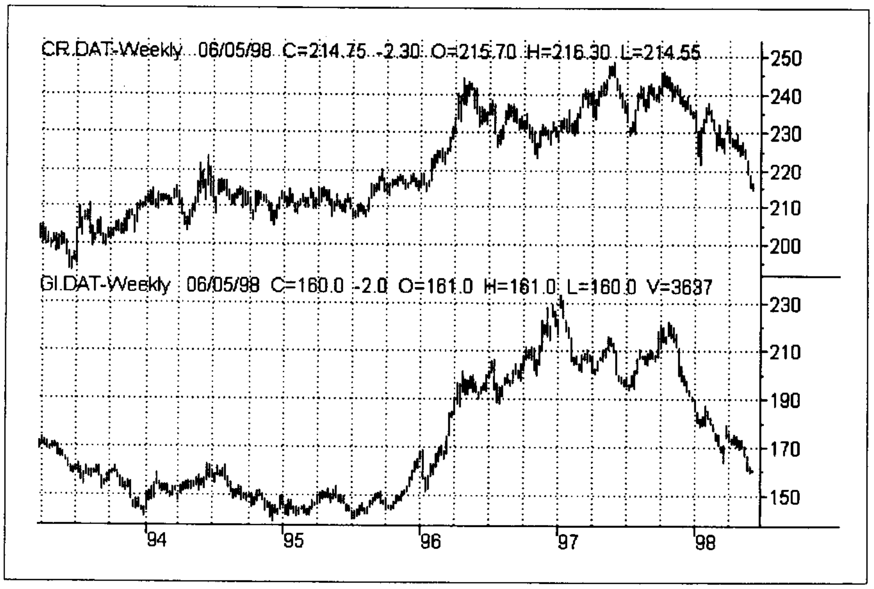
Advantages of the GSCI

As shown in Figure 22-11, the price movement of the GSCI is markedly different from that of the CRB index. The most obvious difference is the different weighting of each component. The GSCI is heavily influenced by the energy sector, with the petroleum sector accounting for over 60 percent of the index. This trait is consistent, however, with its production weighting criteria—energy costs are commonly the highest variable expense for large companies. Thus, one could argue that the GSCI more accurately describes the costs of acquiring raw materials. Thus, institutional investors might be more attracted to the GSCI than the CRB.

The second advantage of the GSCI is that each commodity in the index is represented by only one contract month at a time. For example, live cattle futures would be represented in the GSCI index based on the price of the most active cattle. Thus, there should be active arbitrage opportunities between GSCI futures and the underlying markets. This makes for more efficient price discovery than the CRB, which is much

FIGURE 22-11

CRB futures index (top) and GSCI. Chart created using TradeStation 4.0 by Omega Research, Inc.



harder to arbitrage (due to the averaging of contracts technique discussed above).

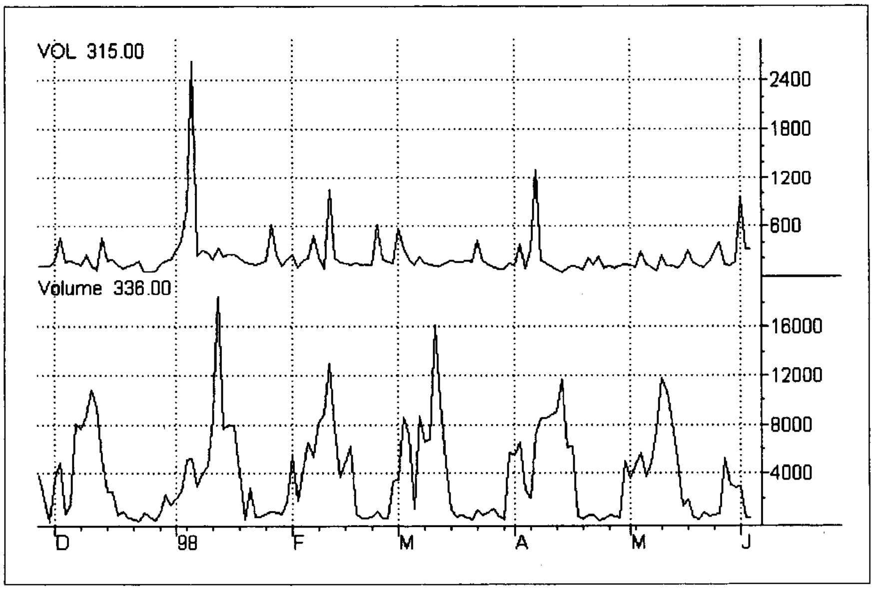
Finally, the third (and perhaps most important) advantage of the GSCI is the liquidity of the futures contracts. As shown in Figure 22-12, the volume of the GSCI has dwarfed that of the CRB contract in recent years. This liquidity difference is probably a function of the first two advantages, with the added backing of Goldman Sachs, a leading investment firm.

NOTES FROM A TRADER—INDEX-BASED FUTURES CONTRACTS

Index-based contracts represent yet another way in which corporations can hedge price risk through the use of futures. An increasingly common practice for institutional participants is the creation of a customized derivative vehicle—often constructed by a bank or similar financial institution—for the same purpose. Although a customized contract might be a more direct hedge, it would not have the liquidity and price discovery mechanisms available in an exchange-traded futures contract.

FIGURE 22-12

Volume comparison—CRB Index (top) vs. GSCI (bottom), daily volume. Chart created using TradeStation 4.0 by Omega Research, Inc.



The other users of commodity-indexed contracts perceive them as a separate asset class and use them to diversify beyond the traditional stock and bond portfolio mix. Having real assets in a portfolio is a natural way to hedge against the effect of inflation on traditional investments. Including commodity exposure in a portfolio also provides a hedge against both geopolitical and natural disaster event risks that tend to disrupt the supply of important commodities, adversely affecting the economy.[12]

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[12] Ibid.

INDEX

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