CHAPTER 16

Futures Contracts

Trading in futures contracts adds a time dimension to commodity markets. A futures contract separates the date of the agreement - when a delivery price is specified - from the date when delivery and payment actually occur. By separating these dates, buyers and sellers achieve an important and flexible tool for risk management. So fundamental is this underlying principle that it has been practiced for several millennia and is likely to be around for several more.

A hallmark of ancient civilization was the trading of commodities at an officially designated marketplace. Indeed, the Forum and the Agora defined Rome and Athens as centers of civilization as much as the Pantheon and the Parthenon. While commodities trading was normally conducted on the basis of barter or coin-and-carry, the use of what are known as forward contracts dates at least to ancient Babylonia, where they were regulated by Hammurabi's Code.

This chapter covers modern-day versions of these activities. The first sections discuss the basics of futures contracts and how their prices are quoted in the financial press. From there, we move into a general discussion of how futures contracts are used and the relationship between current cash prices and futures prices.

(*marg. def.* **forward contract** Agreement between a buyer and a seller, who both commit to a transaction at a future date at a price set by negotiation today.)

16.1 Futures Contract Basics

By definition, a **forward contract** is a formal agreement between a buyer and a seller, who both commit to a commodity transaction at a future date at a price set by negotiation today. The genius of forward contracting is that it allows a producer to sell a product to a willing buyer before it is actually produced. By setting a price today, both buyer and seller remove price uncertainty as a source of risk. With less risk, buyers and sellers mutually benefit and commerce is stimulated. This principle has been understood and practiced for centuries.

(*marg. def.* **futures contract** Contract between a seller and a buyer specifying a commodity or financial instrument to be delivered and paid for at contract maturity. Futures contracts are managed through an organized futures exchange.)

(*marg. def.* **futures price** Price negotiated by buyer and seller at which the underlying commodity or financial instrument will be delivered and paid for to fulfill the obligations of a futures contract.)

Futures contracts represent a step beyond forward contracts. Futures contracts and forward contracts accomplish the same economic task, which is to specify a price today for future delivery. This specified price is called the **futures price**. However, while a forward contract can be struck between any two parties, futures contracts are managed through an organized futures exchange. Sponsorship through a futures exchange is a major distinction between a futures contract and a forward contract.

History of Futures Trading

History buffs will be interested to know that organized futures trading appears to have originated in Japan during the early Tokugawa era, that is, the seventeenth century. As you might guess, these early Japanese futures markets were devoted to trading contracts for rice. Tokugawa rule ended in 1867, but active rice futures markets continue on to this day.

The oldest organized futures exchange in the United States is the Chicago Board of Trade (CBOT). The CBOT was established in 1848 and grew with the westward expansion of American ranching and agriculture. Today, the CBOT is the largest, most active futures exchange in the world. Other early American futures exchanges still with us today include the MidAmerica Commodity Exchange founded in 1868, New York Cotton Exchange (1870), New York Mercantile Exchange (1872), Chicago Mercantile Exchange (1874), New York Coffee Exchange (1882), and the Kansas City Board of Trade (1882).

For more than 100 years, American futures exchanges devoted their activities exclusively to commodity futures. However, a revolution began in the 1970s with the introduction of financial futures. Unlike commodity futures, which call for delivery of a physical commodity, financial futures require delivery of a financial instrument. The first financial futures were foreign currency contracts introduced in 1972 at the International Monetary Market (IMM), a division of the Chicago Mercantile Exchange (CME).

Next came interest rate futures, introduced at the Chicago Board of Trade in 1975. An interest rate futures contract specifies delivery of a fixed-income security. For example, an interest rate futures contract may specify a U.S. Treasury bill, note, or bond as the underlying instrument. Finally, stock index futures were introduced in 1982 at the Kansas City Board of Trade (KBT), the

Chicago Mercantile Exchange, and the New York Futures Exchange (NYFE). A stock index futures contract specifies a particular stock market index as its underlying instrument.

Financial futures have been so successful that they now constitute the bulk of all futures trading. This success is largely attributed to the fact that financial futures have become an indispensable tool for financial risk management by corporations and portfolio managers. As we will see, futures contracts can be used to reduce risk through hedging strategies or used to increase risk through speculative strategies. In this chapter, we discuss futures contracts generally, but, since this text deals with financial markets, we will ultimately focus on financial futures.

Futures Contract Features

Futures contracts are a type of derivative security because the value of the contract is derived from the value of an underlying instrument. For example, the value of a futures contract to buy or sell gold is derived from the market price of gold. However, because a futures contract represents a zero-sum game between a buyer and a seller, the net value of a futures contract is always zero. That is, any gain realized by the buyer is exactly equal to a loss realized by the seller, and vice versa.

Futures are contracts, and, in practice, exchange-traded futures contracts are standardized to facilitate convenience in trading and price reporting. Standardized futures contracts have a set contract size specified according to the particular underlying instrument. For example, a standard gold futures contract specifies a contract size of 100 troy ounces. This means that a single gold futures contract obligates the seller to deliver 100 troy ounces of gold to the buyer at contract maturity. In turn, the contract also obligates the buyer to accept the gold delivery and pay the negotiated futures price for the delivered gold.

To properly understand a futures contract, we must know the specific terms of the contract. In general, futures contracts must stipulate at least the following five contract terms:

1. The identity of the underlying commodity or financial instrument,
2. The futures contract size,
3. The futures maturity date, also called the expiration date, and
4. The delivery or settlement procedure,
5. The futures price.

First, a futures contract requires that the underlying commodity or financial instrument be clearly identified. This is stating the obvious, but it is important that the obvious is clearly understood in financial transactions.

Second, the size of the contract must be specified. As stated earlier, the standard contract size for gold futures is 100 troy ounces. For U.S. Treasury note and bond futures, the standard contract size is $100,000 in par value notes or bonds, respectively.

The third contract term that must be stated is the maturity date. Contract maturity is the date on which the seller is obligated to make delivery and the buyer is obligated to make payment.

Fourth, the delivery process must be specified. For commodity futures, delivery normally entails sending a warehouse receipt for the appropriate quantity of the underlying commodity. After delivery, the buyer pays warehouse storage costs until the commodity is sold or otherwise disposed.

Finally, the futures price must be mutually agreed on by the buyer and seller. The futures price is quite important, since it is the price that the buyer will pay and the seller will receive for delivery at contract maturity.

For financial futures, delivery is often accomplished by a transfer of registered ownership. For example, ownership of U.S. Treasury bill, note, and bond issues is registered at the Federal Reserve in computerized book-entry form. Futures delivery is accomplished by a notification to the Fed to effect a change of registered ownership.

Other financial futures feature cash settlement, which means that the buyer and seller simply settle up in cash with no actual delivery. We discuss cash settlement in more detail when we discuss stock index futures. The important thing to remember for now is that delivery procedures are selected for convenience and low cost. Specific delivery procedures are set by the futures exchange and may change slightly from time to time.

Futures Prices

The largest volume of futures trading in the United States takes place at the Chicago Board of Trade, which accounts for about half of all domestic futures trading. However, futures trading is also quite active at other futures exchanges. Current futures prices for contracts traded at the major futures exchanges are reported each day in the *Wall Street Journal*. Figure 16.1 reproduces a portion of the daily "Futures Prices" report of the *Wall Street Journal*.

Figure 16.1 about here

This section of the *Journal* contains a box labeled "Exchange Abbreviations," which lists the major world futures exchanges and their exchange abbreviation codes. Elsewhere, the information is divided into sections according to categories of the underlying commodities or financial instruments. For example, the section, "Grains and Oilseeds," contains futures price information for wheat, oats, soybeans, and similar crops. The section “Metals and Petroleum” reports price information for copper, gold, and petroleum products. There are separate sections for financial futures, which include “Currency,” “Interest Rate,” and “Index” categories.

Each section states the contract name, futures exchange, and contract size, along with price information for various contract maturities. For example, under “Metals and Petroleum” we find the Copper contract traded at the Commodities Exchange (COMEX) Division of the New York Mercantile Exchange (CMX.Div.NYM). The standard contract size for copper is 25,000 pounds per contract. The futures price is quoted in cents per pound.

Example 16.1 Futures Quotes In Figure 16.1, locate the gold contract. Where is it traded? What does one contract specify?

The gold contract, like the copper contract, trades on the COMEX. One contract calls for delivery of 100 troy ounces. The futures price is quoted in dollars per ounce.

The reporting format for each futures contract is similar. For example, the first column of a price listing gives the contract delivery/maturity month. For each maturity month, the next five columns report futures prices observed during the previous day at the opening of trading (“Open”), the highest intraday price (“High”), the lowest intraday price (“Low”), the price at close of trading (“Settle”), and the change in the settle price from the previous day (“Change”).

The next two columns (“Lifetime,” “High and Low”) report the highest and lowest prices for each maturity observed over the previous year. Finally, the last column reports Open Interest for each contract maturity, which is the number of contracts outstanding at the end of that day's trading. The last row below these eight columns summarizes trading activity for all maturities by reporting aggregate trading volume and open interest for all contract maturities.

By now, we see that four of the contract terms for futures contracts are stated in the futures prices listing. These are:

1. The identity of the underlying commodity or financial instrument,
2. The futures contract size,
3. The futures maturity date,
4. The futures price.

Exact contract terms for the delivery process are available from the appropriate futures exchange on request.

Example 16.2 Futures Prices In Figure 16.1, locate the soybean contract with the greatest open interest. Explain the information provided.

The soybean (or just "bean") contract with the greatest open interest is specified by the contract maturity with the greatest number of contracts outstanding, so the March contract is the one we seek. One contract calls for delivery of 5,000 bushels of beans (a bushel, of course, is four pecks). The closing price for delivery at that maturity is stated as a quote in cents per bushel. Since there are 5,000 bushels in a single contract, the total contract value is the quoted price per bushel times 5,000, or $23,700 for the March contract.

To get an idea of the magnitude of financial futures trading, take a look at the first entry under "Interest Rate" in Figure 16.1, the CBT Treasury Bond contract. One contract calls for the delivery of $100,000 in par value bonds. The total open interest in this one contract is often close to half a million contracts. Thus the total face value represented by these contracts is close to half a *trillion* dollars.

Who does all this trading? Well the orders originate from money managers around the world and are sent to the various exchanges' trading floors for execution. On the floor, the orders are executed by professional traders who are quite aggressive at getting the best prices. On the floor and off, futures traders can be recognized by their colorful jackets. As the *Wall Street Journal* article in the nearby Investment Update box reports, these garish jackets add a touch of clamor to the trading pits. In the next section we will discuss how and why futures contracts are used for speculation and hedging.

CHECK THIS

16.1a What is a forward contract? A futures contract?

16.1b What is a futures price?

Investment Updates: Garrish Jackets

16.2 Why Futures?

Futures contracts can be used for speculation or for hedging. Certainly, hedging is the major economic purpose for the existence of futures markets. However, a viable futures market cannot exist without participation by both hedgers and speculators. Hedgers transfer price risk to speculators, and speculators absorb price risk. Hedging and speculating are complementary activities. We next discuss speculating with futures; and then we discuss hedging with futures.

Speculating with Futures

Suppose you are thinking about speculating on commodity prices because you believe you can accurately forecast future prices most of the time. The most convenient way to speculate is with futures contracts. If you believe that the price of gold will go up, then you can speculate on this belief by buying gold futures. Alternatively, if you think gold will fall in price, you can speculate by selling gold futures. To be more precise, you think that the current futures price is either too high or too low relative to what gold prices will be in the future.

Buying futures is often referred to as "going long," or establishing a **long position**. Selling futures is often called "going short," or establishing a **short position**. A **speculator** accepts price risk in order to bet on the direction of prices by going long or short.

(*marg. def.* **long position** In futures jargon, refers to the contract buyer. A long position profits from a futures price increase.)

(*marg. def.* **short position** In futures jargon, refers to the seller. A short position profits from a futures price decrease.)

(*marg. def.* **speculator** Trader who accepts price risk by going long or short to bet on the future direction of prices.)

To illustrate the basics of speculating, suppose you believe the price of gold will go up. In particular, the current futures price for delivery in three months is $400 per ounce. You think that gold will be selling for more than that three months from now, so you go long 100 three-month gold contracts. Each gold contract represents 100 troy ounces, so 100 contracts represents 10,000 ounces of gold with a total contract value of 10,000 × $400 = $4,000,000. In futures jargon, this is a $4 million long gold position.

Now, suppose your belief turns out to be correct and at contract maturity the market price of gold is $420 per ounce. From your long futures position, you accept delivery of 10,000 troy ounces of gold at $400 per ounce and immediately sell the gold at the market price of $420 per ounce. Your profit is $20 per ounce or 10,000 × $20 = $200,000, less applicable commissions.

Of course, if your belief turned out wrong and gold fell in price, you would lose money since you must still buy the 10,000 troy ounces at $400 per ounce to fulfill your futures contract obligations. Thus, if gold fell to, say, \$390 per ounce, you would lose \$10 per ounce or 10,000 × \$10 = \$100,000. As this example suggests, futures speculation is risky, but it is potentially rewarding if you can accurately forecast the direction of future commodity price movements.

As another example of commodity speculation, suppose an analysis of weather patterns has convinced you that the coming winter months will be warmer than usual, and that this will cause heating oil prices to fall as unsold inventories accumulate. You can speculate on this belief by selling heating oil futures.

Figure 16.1 reveals that the standard contract size for heating oil is 42,000 gallons. Suppose you go short 10 contracts at a futures price of 55 cents per gallon. This represents a short position with a total contract value of 10 × 42,000 × \$.55 = \$231,000.

If, at contract maturity, the price of heating oil is, say, 50 cents per gallon, you could buy 420,000 gallons for delivery to fulfill your futures commitment. Your profit would be 5 cents per gallon, or 10 × 42,000 × \$.05 = \$21,000, less applicable commissions. Of course, if heating oil prices rise by 5 cents per gallon, you would lose \$21,000 instead. Again, speculation is risky but rewarding if you can accurately forecast the weather.

Example 16.3 What Would Juan Valdez Do? After an analysis of political currents in Central and South America, you conclude that future coffee prices will be lower than currently indicated by futures prices. Would you go long or short? Analyze the impact of a swing in coffee prices of 10 cents per pound in either direction if you have a 10-contract position, where each contract calls for delivery of 37,500 pounds of coffee.

You would go short since you expect prices to decline. You're short 10 contracts, so you must deliver 10×37,500 = 375,000 pounds of coffee. If coffee prices fall to 10 cents below your originally contracted futures price, then you make 10 cents per pound, or \$37,500. Of course, if you're wrong and prices are 10 cents higher, you lose \$37,500.

Hedging With Futures

Many businesses face price risk when their activities require them to hold a working inventory. For example, suppose you own a regional gasoline distributorship and must keep a large operating inventory of gas on hand, say, 5 million gallons. In futures jargon, this gasoline inventory represents a long position in the underlying commodity.

If gas prices go up, your inventory goes up in value; but if gas prices fall, your inventory value goes down. Your risk is not trivial, since even a 5-cent fluctuation in the gallon price of gas will cause your inventory to change in value by $250,000. Because you are in the business of distributing gas, and not speculating on gas prices, you would like to remove this price risk from your business operations. Acting as a **hedger**, you seek to transfer price risk by taking a futures position opposite to an existing position in the underlying commodity or financial instrument. In this case, the value of your gasoline inventory can be protected by selling gasoline futures contracts.

(*marg. def.* **hedger** Trader who seeks to transfer price risk by taking a futures position opposite to an existing position in the underlying commodity or financial instrument.)

Gasoline futures are traded on the New York Mercantile exchange (NYM), and the standard contract size for gasoline futures is 42,000 gallons per contract. Since you wish to hedge 5 million gallons, you need to sell 5,000,000 / 42,000 = 119 gasoline contracts. With this hedge in place, any change in the value of your long inventory position is canceled by an approximately equal but opposite change in value of your short futures position. Because you are using this short position for hedging purposes, it is called a **short hedge**.

(*marg. def.* **short hedge** Sale of futures to offset potential losses from falling prices.)

By hedging, you have greatly reduced or even eliminated the possibility of a loss from a decline in the price of gasoline. However, you have also eliminated the possibility of a gain from a price increase. This is an important point. If gas prices rise, you would have a substantial loss on your futures position, offsetting the gain on your inventory. Overall, you are long the underlying commodity because you own it; you offset the risk in your long position with a short position in futures.

Of course, your business activities may also include distributing other petroleum products like heating oil and natural gas. Futures contracts are available for these petroleum products also, and therefore they may be used for inventory hedging purposes.

Example 16.4 Short Hedging Suppose you have an inventory of 1.2 million pounds of soybean oil. Describe how you would hedge this position.

Since you are long in the commodity, bean oil, you need to go short in (sell) futures. A single bean oil contract calls for delivery of 60,000 pounds of oil. To hedge your position, you need to sell 1.2 million / 60,000 = 20 futures contracts.

(*marg. def.* **long hedge** Purchase of futures to offset potential losses from rising prices.)

The opposite of a short hedge is a **long hedge**. In this case, you do not own the underlying commodity, but you need to acquire it in the future. You can lock in the price you will pay in the future by buying, or going long in, futures contracts. In effect, you are short the underlying commodity because you must buy it in the future. You offset your short position with a long position in futures.

Example 16.5: More Hedging You need to buy 600,000 pounds of orange juice in three months. How can you hedge the price risk associated with this future purchase? What price will you effectively lock in? One orange juice contract calls for delivery of 15,000 pounds of juice concentrate.

You are effectively short orange juice since you don't currently own it but plan to buy it. To offset the risk in this short position, you need to go long in futures. You should buy 600,000 / 15,000 = 40 contracts. The price you lock in is the original futures price.

Example 16.6 Even More Hedging Suppose your company will receive payment of £10 million in six months, which will then be converted to U.S. dollars. What is the standard futures contract size for British pounds? Describe how you could use futures contracts to lock in an exchange rate from British pounds to U.S. dollars for your planned receipt of £10 million, including how many contracts are required.

Your company will be receiving £10 million, so you are effectively long pounds. To hedge, you need to short (sell) futures contracts. Put differently, you will want to exchange pounds for dollars. By selling a futures contract, you obligate yourself to deliver the underlying commodity, in this case currency, in exchange for payment in dollars. One British pound contract calls for delivery of £62,500. You will therefore sell £10 million / £62,500 = 160 contracts.

CHECK THIS

16.2a What is a long position in futures? A short position? For a speculator, when is each appropriate?

16.2b What is a long hedge? A short hedge?

16.3 Futures Trading Accounts

A futures exchange, like a stock exchange, allows only exchange members to trade on the exchange. Exchange members may be firms or individuals trading for their own accounts, or they may be brokerage firms handling trades for customers. Some firms conduct both trading and brokerage operations on the exchange. In this section, we discuss the mechanics of a futures trading account as it pertains to a customer with a trading account at a brokerage firm.

The biggest customer trading accounts are those of corporations that use futures to manage their business risks and money managers who hedge or speculate with clients' funds. Many individual investors also have futures trading accounts of their own, although speculation by individual investors is not recommended without a full understanding of all risks involved. Whether a futures trading account is large or small, the mechanics of account trading are essentially the same.

(*marg. def.* **futures margin** Deposit of funds in a futures trading account dedicated to covering potential losses from an outstanding futures position.)

(*marg. def.* **initial margin** Amount required when a futures contract is first bought or sold. Initial margin varies with the type and size of a contract, but it is the same for long and short futures positions.)

There are several essential things to know about futures trading accounts. The first thing to know about a futures trading account is that margin is required. In this way, futures accounts resemble the stock margin accounts we discussed in Chapter 2; however, the specifics are quite different. **Futures margin** is a deposit of funds in a futures trading account dedicated to covering potential losses from an outstanding futures position. An **initial margin** is required when a futures position is first established. The amount varies according to contract type and size, but margin requirements for futures contracts usually range between 2 percent to 5 percent of total contract value. Initial margin is the same for both long and short futures positions.

(*marg. def.* **marking-to-market** In futures trading accounts, the process whereby gains and losses on outstanding futures positions are recognized on a daily basis.)

The second thing to know about a futures trading account is that contract values in outstanding futures positions are marked to market on a daily basis. **Marking-to-market** is a process whereby gains and losses on outstanding futures positions are recognized at the end of each day's trading.

For example, suppose one morning you call your broker and instruct her to go long five U.S. Treasury bond contracts for your account. A few minutes later, she calls back to confirm order execution at a futures price of 110. Since the Treasury bond contract size is $100,000 par value, contract value is 110% × $100,000 = $110,000 per contract. Thus the total position value for your order is $550,000, for which your broker requires $30,000 initial margin. In addition, your broker requires that at least $25,000 in **maintenance margin** be present at all times. The necessary margin funds are immediately wired from a bank account to your futures account.

(*marg. def.* **maintenance margin** The minimum margin level required in a futures trading account at all times.)

Now, at the end of trading that day Treasury bond futures close at a price of 108. Overnight, all accounts are marked to market. Your Treasury bond futures position is marked to $108,000 per contract or $540,000 total position value, representing a loss of $10,000. This loss is deducted from your initial margin to leave only $20,000 of margin funds in your account.

(*marg. def.* **margin call** Notification to increase the margin level in a trading account.)

Since the maintenance margin level on your account is $25,000, your broker will issue a **margin call** on your account. Essentially, your broker will notify you that you must immediately restore your margin level to the initial margin level of $30,000, or else she will close out your Treasury bond futures position at whatever trading price is available at the exchange.

This example illustrates what happens when a futures trading account is marked to market and the resulting margin funds fall below the maintenance margin level. The alternative, and more pleasant experience occurs when a futures price moves in your favor, and the marking-to-market process adds funds to your account. In this case, marking-to-market gains can be withdrawn from your account so long as remaining margin funds are not less than the initial margin level.

(*marg. def.* **reverse trade** A trade that closes out a previously established futures position by taking the opposite position.)

The third thing to know about a futures trading account is that a futures position can be closed out at any time; you do not have to hold a contract until maturity. A futures position is closed out by simply instructing your broker to close out your position. To actually close out a position, your broker will enter a **reverse trade** for your account.

A reverse trade works like this: Suppose you are currently short five Treasury bond contracts, and you instruct your broker to close out the position. Your broker responds by going long five Treasury bond contracts for your account. In this case, going long five contracts is a reverse trade because it cancels exactly your previous five-contract short position. At the end of the day of your reverse trade, your account will be marked to market at the futures price realized by the reverse trade. From then on, your position is closed out and no more gains or losses will be realized.

This example illustrates that closing out a futures position is no more difficult than initially entering into a position. There are two basic reasons to close out a futures position before contract maturity. The first is to capture a current gain or loss, without realizing further price risk. The second is to avoid the delivery requirement that comes from holding a futures contract until it matures. In fact, over 98 percent of all futures contracts are closed out before contract maturity, which indicates that less than 2 percent of all futures contracts result in delivery of the underlying commodity or financial instrument.

Before closing this section, let’s briefly list the three essential things to know about a futures trading account as discussed above:

1. Margin is required,
2. Futures accounts are marked-to-market daily,
3. A futures position can be closed out any time by a reverse trade.

Understanding the items in this list is important to anyone planning to use a futures trading account.

CHECK THIS

16.3a What are the three essential things you should know about a futures trading account?

16.3b What is meant by initial margin for a futures position? What is meant by maintenance margin for a futures position?

16.3c Explain the process of marking to market a futures trading account? What is a margin call, and when is one issued?

16.3d How is a futures position closed out by a reverse trade? What proportion of all futures positions are closed out by reverse trades rather than by delivery at contract maturity?

16.4 Cash Prices Versus Futures Prices

We now turn to the relationship between the today's price of some commodity or financial instruments and its futures price. We begin by examining current cash prices.

(*marg. def.* **cash price** Price of a commodity or financial instrument for current delivery. Also called the **spot price**.)

(*marg. def.* **cash market** Market in which commodities or financial instruments are traded for essentially immediate delivery. Also called the **spot market**.)

Cash Prices

The **cash price** of a commodity or financial instrument is the price quoted for current delivery. The cash price is also called the **spot price**, as in “on the spot.” In futures jargon, terms like “spot gold” or “cash wheat” are used to refer to commodities being sold for current delivery in what is called the **cash market** or the **spot market**.

Figure 16.2 reproduces the “Cash Prices” column of the *Wall Street Journal*, published the same day as the “Futures Prices” column seen shown in Figure 16.1. The column is divided into sections according to commodity categories. For example, the first section “Grains and Feeds” contains spot price information for wheat, corn, soybeans, and similar crops. Other commodity sections include “Foods, Fats and Oils,” “Metals,” and “Precious Metals.” Each section gives commodity names along with cash market prices for the last two days of trading and one year earlier.

Figure 16.2 about here

Cash-Futures Arbitrage

Intuitively, you might think that there is a close relationship between the cash price of a commodity and its futures price. If you do, then your intuition is quite correct. In fact, your intuition is backed up by strong economic argument and more than a century of experience observing the simultaneous operation of cash and futures markets.

As a routine matter, cash and futures prices are closely watched by market professionals. To understand why, suppose you notice that spot gold is trading for $400 per ounce while the two-month futures price is $450 per ounce. Do you see a profit opportunity?

You should, because buying spot gold today at $400 per ounce while simultaneously selling gold futures at $450 per ounce locks in a $50 per ounce profit. True, gold has storage costs (you have to put it somewhere), and a spot gold purchase ties up capital that could be earning interest. However, these costs are small relative to the $50 per ounce gross profit, which works out to be $50 / $400 = 12.5% per two months, or about 100% per year (with compounding). Furthermore, this profit is risk-free! Alas, in reality, such easy profit opportunities are the stuff of dreams.

(*marg. def.* **cash-futures arbitrage** Earning risk-free profits from an unusually large difference between cash and futures prices.

Earning risk-free profits from an unusual difference between cash and futures prices is called **cash-futures arbitrage**. In a competitive market, cash-futures arbitrage has very slim profit margins. In fact, the profit margins are almost imperceptible when they exist at all.

(*marg. def.* **basis** The difference between the cash price and the futures price for a commodity, i.e., basis = cash price - futures price.)

Comparing cash prices for commodities in Figure 16.2 with their corresponding futures prices reported in Figure 16.1, you will find that cash prices and futures prices are seldom equal. In futures jargon, the difference between a cash price and a futures price is called **basis**.[1]

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[1] Confusingly, basis is sometimes presented as the futures price less the cash price. The official Commodity Trading Manual of the Chicago Board of Trade defines basis as the difference between the cash and the futures price, i.e., basis = cash price - futures price. We will be consistent with the CBOT definition.

(*marg. def.* **carrying-charge market** Refers to the case where the futures price is greater than the cash price; i.e., the basis is negative.)

(*marg. def.* **inverted market** The case where the futures price is less than the cash price; i.e., the basis is positive.)

For commodities with storage costs, the cash price is usually less than the futures price. This is referred to as a **carrying-charge market**. Sometimes, however, the cash price is greater than the futures price and this is referred to as an **inverted market**. We can summarize this discussion of carrying-charge markets, inverted markets, and basis as follows:

Carrying-charge market: **Basis = Cash price - Futures price < 0** [16.1]

Inverted market: **Basis = Cash price - Futures price > 0**

A variety of factors can lead to an economically justifiable difference between a commodity's cash price and its futures price, including availability of storage facilities, transportation costs, and seasonal price fluctuations. However, the primary determinants of cash-futures bases are storage costs and interest costs. Storage cost is the cost of holding the commodity in a storage facility, and interest cost refers to interest income forgone because funds are being used to buy and hold the commodity.

If a futures price rises far enough above a cash price to more than cover storage costs and interest expense, commodity traders will undertake cash-futures arbitrage by buying in the cash market and selling in the futures market. This drives down the futures price and drives up the cash price until the basis is restored to an economically justifiable level.

Similarly, if a futures price falls far enough relative to a cash price, traders will undertake cash-futures arbitrage by short selling in the cash market and buying in the futures market. This drives down the cash price and drives up the futures price until an economically justifiable basis is restored. In both cases, arbitrage ensures that the basis is kept at an economically appropriate level.

Spot-Futures Parity

We can be a little bit more precise concerning the relationship between spot and futures prices for financial futures. To illustrate, suppose we had a futures contract on shares of common stock in a single company (actually there are no such contracts in the U.S.). This particular stock does not pay dividends.

For concreteness, suppose the contract calls for delivery of 1,000 shares of stock in one year. The current (i.e., cash or spot) price is $50 per share. Also, 12-month T-bills are yielding 6 percent. What should the futures price be? To answer, notice that you can buy 1,000 shares of stock for $50 per share, or $50,000 total. You can eliminate all of the risk associated with this purchase by selling one futures contract. The net effect of this transaction is that you have created a risk-free asset. Since the risk-free rate is 6 percent, your investment must have a future value of $50,000 × 1.06 = $53,000. In other words, the futures price should be $53 per share.

Suppose the futures price is, in fact, $52 per share. What would you do? To make a great deal of money, you would short 1,000 shares of stock at $50 per share and invest the $50,000 proceeds at 6 percent.[2] Simultaneously, you would buy one futures contract.

[2]For the sake of simplicity, we ignore the fact that individual investors don't earn interest on the proceeds from a short sale.

At the end of the year, you would have $53,000. You would use $52,000 to buy the stock to fulfill your obligation on the futures contract and then return the stock to close out the short position. You pocket $1,000. This is just another example of cash-futures arbitrage.

More generally, if we let F be the futures price, S be the spot price, and r be the risk-free rate, then our example illustrates that

$$\boldsymbol{F = S(1 + r)} \qquad [16.2]$$

In other words, the futures price is simply the future value of the spot price, calculated at the risk-free rate. This is the famous **spot-futures parity** condition. This condition must hold in the absence of cash-futures arbitrage opportunities.

(*marg. def.* **spot-futures parity** The relationship between spot prices and futures prices that holds in the absence of arbitrage opportunities.)

More generally, if r is the risk-free rate per period, and the futures contract matures in T periods, then the spot-futures parity condition is

$$\boldsymbol{F = S(1 + r)^T} \qquad [16.3]$$

Notice that T could be a fraction of one period. For example, if we have the risk-free rate per year, but the futures contract matures in six months, T would be ½.

Example 16.7 Parity Check A non-dividend-paying stock has a current price of $12 per share. The risk-free rate is 4 percent per year. If a futures contract on the stock matures in 3 months, what should the futures price be?

From our spot-futures parity condition, we have

$$
\begin{aligned}
F &= S(1 + r)^T \\
&= \$12(1.04)^{1/4} \\
&= \$12.12
\end{aligned}
$$

The futures price should be $12.12. Notice that T, the number of periods, is ¼ because the contract matures in one quarter.

More on Spot-Futures Parity

In our spot-futures parity example just above, we assumed that the underlying financial instrument (the stock) had no cash flows (no dividends). If there are dividends (for a stock future) or coupon payments (for a bond future), then we need to modify our spot-futures parity condition.

For a stock, we let *D* stand for the dividend, and we assume that the dividend is paid in one period, at or near the end of the futures contract's life. In this case, the spot-futures parity condition becomes

$$F = S(1 + r) - D \qquad [16.4]$$

Notice that we have simply subtracted the amount of the dividend from the future value of the stock price. The reason is that if you buy the futures contract, you will not receive the dividend, but the dividend payment will reduce the stock price.

An alternative, and very useful, way of writing the dividend-adjusted spot-futures parity result in Equation 16.4 is to define *d* as the dividend yield on the stock. Recall that the dividend yield is just the upcoming dividend divided by the current price. In our current notation, this is just $d = D/S$. With this in mind, we can write the dividend-adjusted parity result as

$$\begin{aligned} F &= S(1 + r) - D\,(S/S) \qquad [16.5] \\ &= S(1 + r) - S\,(D/S) \\ &= S(1 + r) - Sd \\ &= S(1 + r - d) \end{aligned}$$

Finally, as above, if there is something other than a single period involved, we would write

$$F = S(1 + r - d)^T \qquad [16.6]$$

where *T* is the number of periods (or fraction of a period).

For example, suppose there is a futures contract on a stock with a current price of $80. The futures contract matures in six months. The risk-free rate is 7 percent per year, and the stock has an annual dividend yield of 3 percent. What should the futures price be?

Plugging in to our dividend-adjusted parity equation, we have

$$F = S(1 + r - d)^T$$
$$= \$80(1 + .07 - .03)^{1/2}$$
$$= \$81.58$$

Notice that we set T equal to ½ since the contract matures in six months.

CHECK THIS

16.4a What is the spot price for a commodity?

16.4b With regard to futures contracts, what is the basis?

16.4c What is an inverted market?

16.4d What is the spot-futures parity condition?

16.5 Stock Index Futures

While there are no futures contracts on individual stocks, there are a number of contracts on stock market indexes. Because these contracts are particularly important, we devote this entire section to them. We first describe the contracts and then discuss some trading and hedging strategies involving their use.

Basics of Stock Index Futures

Locate the section labeled “Index” in Figure 16.1 Here we see various stock index futures contracts. The second contract listed, on the S&P 500 index, is the most important. With this contract, actual delivery would be very difficult or impossible because the seller of the contract would have to buy all 500 stocks in exactly the right proportions to deliver. Clearly, this is not practical, so this contract features cash settlement.

To understand how stock index futures work, suppose you bought one S&P 500 contract at a futures price of 1,300. The contract size is $250 times the level of the index. What this means is that, at maturity, the buyer of the contract will pay the seller $250 times the difference between the futures price of 1,300 and the level of the S&P 500 index at contract maturity.

For example, suppose that at maturity the S&P had actually fallen to 1,270. In this case, the buyer of the contract must pay $250 × (1,300 - 1,270) = $7,500 to the seller of the contract. In effect, the buyer of the contract has agreed to purchase 250 units of the index at a price of $1,300 per unit. If the index is below 1,300, the buyer will lose money. If the index is above that, then the seller will lose money.

Example 16.8 Index Futures. Suppose you are convinced that mid-cap stocks are going to skyrocket in value. Consequently, you buy 20 S&P Midcap 400 contracts maturing in six months at a price of 395. Suppose that the S&P Midcap 400 index is at 410 when the contracts mature. How much will you make or lose?

The futures price is 395, and the contract size is $500 times the level of the index. If the index is actually at 410, you make $500 × (410 - 395) = $7,500 per contract. With 20 contracts, your total profit is $150,000.

(*marg. def.* **index arbitrage** Strategy of monitoring the futures price on a stock index and the level of the underlying index to exploit deviations from parity.)

Index Arbitrage

The spot-futures parity relation we developed above is the basis for a common trading strategy known as **index arbitrage**. Index arbitrage refers to monitoring the futures price on a stock index along with the level of the underlying index. The trader looks for violations of parity and trades as appropriate.

For example, suppose the S&P 500 futures price for delivery in one year is 1,340. The current level is 1,300. The dividend yield on the S&P is projected to be 3 percent per year, and the risk-free rate is 5 percent. Is there a trading opportunity here?

From our dividend-adjusted parity equation (16.6), the futures price should be

$$\begin{aligned} F &= S(1 + r - d)^T \\ &= 1{,}300(1 + .05 - .03)^1 \\ &= 1{,}326 \end{aligned}$$

Thus, based on our parity calculation, the futures price is too low. We want to buy low, sell high, so we sell the index and simultaneously buy the futures contract.

(*marg. def.* **program trading** In futures jargon, refers to computer-assisted monitoring of relative prices of financial assets and, potentially, computer submission of buy and sell orders to exploit perceived arbitrage opportunities.)

Index arbitrage is often implemented as a **program trading** strategy. While this term covers a lot of ground, it generally refers to the monitoring of relative prices by computer to more quickly spot opportunities. In some cases, it includes submitting the needed buy and sell orders using a computer to speed up the process.

Whether a computer is used in program trading is not really the issue; instead, a program trading strategy is any coordinated, systematic procedure for exploiting (or trying to exploit) violations of parity or other arbitrage opportunities. Such a procedure is a trading “program” in the sense that whenever certain conditions exist, certain trades are made. Thus the process is sufficiently mechanical that it can be automated, at least in principle.

Technically, the NYSE defines program trading as the simultaneous purchase or sale of at least 15 different stocks with a total value of $1 million or more. Program trading accounts for about 15 percent of total trading volume on the NYSE, and about 20 percent of all program trading involves stock-index arbitrage.

There is another phenomenon often associated with index arbitrage and, more generally, futures and options trading. S&P 500 futures contracts have four expiration months per year, and they expire on the third Friday of those months. On these same four Fridays, options on the S&P index and various individual stock options also expire. These Fridays have been dubbed the “triple witching hour” because all three types of contracts expire, sometimes leading to unusual price behavior.

In particular, on triple witching hour Fridays, all positions must be liquidated, or “unwound.” To the extent that large-scale index arbitrage and other program trading has taken place, sometimes enormous buying or selling occurs late in the day on such Fridays as positions are closed out. Large price swings and, more generally, increased volatility often are seen. To curtail this problem to a certain extent, the exchanges have adopted rules regarding the size of a position that can be carried to expiration, and other rules have been adopted as well.

Hedging Stock Market Risk With Futures

We earlier discussed hedging using futures contracts in the context of a business protecting the value of its inventory. We now discuss some hedging strategies available to portfolio managers based on financial futures. Essentially, an investment portfolio is an inventory of financial securities, and futures can be used to reduce the risk of holding a securities portfolio.

We consider the specific problem of an equity portfolio manager wishing to protect the value of a stock portfolio from the risk of an adverse movement of the overall stock market. Here, the portfolio manager wishes to establish a short hedge position to reduce risk and must determine the number of futures contracts required to properly hedge a portfolio.

In this hedging example, you are responsible for managing a broadly diversified stock portfolio with a current value of $100 million. Analysis of market conditions leads you to believe that the stock market is unusually susceptible to a price decline during the next few months. Of course, nothing is certain regarding stock market fluctuations, but still you are sufficiently concerned to believe that action is required.

(*marg. def.* **cross-hedge** Hedging a particular spot position with futures contracts on a related, but not identical commodity or financial instrument)

A fundamental problem exists for you, however, in that there is no futures contract that exactly matches your particular portfolio. As a result, you decide to protect your stock portfolio from a fall in value caused by a falling stock market using stock index futures. This is an example of a **cross-hedge**, where a futures contract on a related, but not identical, commodity or financial instrument is used to hedge a particular spot position.

Thus, to hedge your portfolio, you wish to establish a short hedge using stock index futures. To do this, you need to know how many index futures contracts are required to form an effective hedge. There are three basic inputs needed to calculate the number of stock index futures contracts required to hedge a stock portfolio:

1. The current value of your stock portfolio,
2. The beta of your stock portfolio,
3. The contract value of the index futures contract used for hedging.

Based on our discussion in Chapter 6, you are familiar with the concept of beta as a measure of market risk for a stock portfolio. Essentially, beta measures portfolio risk relative to the overall stock market. We will assume that you have maintained a beta of 1.25 for your $100 million stock portfolio.

You decide to establish a short hedge using futures contracts on the Standard and Poor's index of 500 stocks (S&P 500), since this is the index you used to calculate the beta for your portfolio. From the *Wall Street Journal*, you find that the S&P 500 futures price for three-month maturity contracts is currently, say, 1,300. Since the contract size for S&P 500 futures is 250 times the index, the current value of a single index futures contract is $250 × 1,300 = $325,000.

You now have all inputs required to calculate the number of contracts needed to hedge your stock portfolio. The number of stock index futures contracts needed to hedge a stock portfolio is determined as follows:

$$\text{Number of contracts} = \frac{\beta_P \times V_P}{V_F} \qquad [16.7]$$

where β_P = Beta of the stock portfolio

V_P = Value of the stock portfolio

V_F = Value of a single futures contract

For your particular hedging problem, β_P = 1.25, V_P = $100 million, and V_F = $325,000, thereby yielding this calculation:

$$\text{Number of contracts} = \frac{1.25 \times \$100{,}000{,}000}{\$325{,}000} \approx 385$$

Thus you can establish an effective short hedge by going short 500 S&P 500 index futures contracts. This short hedge will protect your stock portfolio against the risk of a general fall in stock prices during the life of the futures contracts.

Example 16.9 Hedging with Stock Index Futures How many futures contracts are required to hedge a $250 million stock portfolio with a portfolio beta of .75 using S&P 500 futures with a futures price of 1,200?

Using the formula for the number of contracts, we have

$$\text{Number of contracts} = \frac{.75 \times \$250{,}000{,}000}{\$300{,}000} = 625$$

You therefore need to sell 625 contracts to hedge this $250 million portfolio.

Hedging Interest Rate Risk With Futures

Having discussed hedging a stock portfolio, we now turn to hedging a bond portfolio. As we will see, the bond portfolio hedging problem is similar to the stock portfolio hedging problem. Once again, we will be cross-hedging, but this time using futures contracts on U.S. Treasury notes. Here, our goal is to protect the bond portfolio against changing interest rates.

In this example, you are responsible for managing a bond portfolio with a current value of $100 million. Recently, rising interest rates have caused your portfolio to fall in value slightly, and you are concerned that interest rates may continue to trend upward for the next several months. You decide to establish a short hedge based on 10-year Treasury note futures.

The formula for the number of U.S. Treasury note futures contracts needed to hedge a bond portfolio is

$$\text{Number of contracts} = \frac{D_P \times V_P}{D_F \times V_F} \qquad [16.8]$$

where

D_P	=	Duration of the bond portfolio,
V_P	=	Value of the bond portfolio,
D_F	=	Duration of the futures contract,
V_F	=	Value of a single futures contract.

We already know the value of the bond portfolio, which is $100 million. Also, suppose that the duration of the portfolio is given as eight years. Next, we must calculate the duration of the futures contract and the value of the futures contract.

As a useful rule of thumb, the duration of an interest rate futures contract is equal to the duration of the underlying instrument plus the time remaining until contract maturity:

$$\boldsymbol{D_F = D_U + M_F} \qquad [16.9]$$

where

D_F	Duration of the futures contract
D_U	Duration of the underlying instrument
M_F	Time remaining until contract maturity

For simplicity, let us suppose that the duration of the underlying U.S. Treasury note is 6 ½ years and the futures contract has a maturity of ½ year, yielding a futures contract duration of 7 years.

The value of a single futures contract is the current futures price times the futures contract size. The standard contract size for U.S. Treasury note futures contracts is $100,000 par value. Now suppose that the futures price is 98, or 98 percent of par value. This yields a futures contract value of $100,000 × 0.98 = $98,000.

You now have all inputs required to calculate the number of futures contracts needed to hedge your bond portfolio. The number of U.S. Treasury note futures contracts needed to hedge the bond portfolio is calculated as follows.

$$\text{Number of contracts} = \frac{8 \times \$100{,}000{,}000}{7 \times \$98{,}000} = 1{,}166$$

Thus, you can establish an effective short hedge by going short 1,166 futures contracts for 10-year U.S. Treasury notes. This short hedge will protect your bond portfolio against the risk of a general rise in interest rates during the life of the futures contracts.

Example 16.10 Hedging With U.S. Treasury Note Futures How many futures contracts are required to hedge a $250 million bond portfolio with a portfolio duration of 5 years using 10-year U.S. Treasury note futures with a duration of 7.5 years and a futures price of 105?

Using the formula for the number of contracts, we have

$$\text{Number of contracts} = \frac{5 \times \$250{,}000{,}000}{7.5 \times \$105{,}000} = 1{,}587$$

You therefore need to sell 1,587 contracts to hedge this $250 million portfolio.

(*marg. def.* **cheapest-to-deliver option** Seller's option to deliver the cheapest instrument when a futures contract allows several instruments for delivery. For example, U.S. Treasury note futures allow delivery of any Treasury note with a maturity between 6½ and 10 years.)

Futures Contract Delivery Options

Many futures contracts have a delivery option, whereby the seller can choose among several different "grades" of the underlying commodity or instrument when fulfilling delivery requirements of a futures contract. Naturally, we expect the seller to deliver the cheapest among available options. In futures jargon, this is called the **cheapest-to-deliver option**. The cheapest-to-deliver option is an example of a broader feature of many futures contracts, known as a "quality" option. Of course, futures buyers know about the delivery option, and therefore the futures prices reflects the value of the cheapest-to-deliver instrument.

As a specific example of a cheapest-to-deliver option, the 10-year Treasury note contract allows delivery of *any* Treasury note with a maturity between 6½ and 10 years. This complicates the bond portfolio hedging problem. For the portfolio manager trying to hedge a bond portfolio with U.S. Treasury note futures, the cheapest-to-deliver feature means that a note can be hedged only based on an assumption about which note will actually be delivered. Furthermore, through time the cheapest-to-deliver note may vary, and, consequently, the hedge will have to be monitored regularly to make sure that it correctly reflects the note issue that is most likely to be delivered. Fortunately, because this is a common problem many commercial advisory services provide this information to portfolio managers and other investors.

CHECK THIS

16.5a What is a cross-hedge?

16.5b What are the three basic inputs required to calculate the number of stock index futures contracts needed to hedge an equity portfolio?

16.5c What are the basic inputs required to calculate the number of U.S. Treasury note futures contracts needed to hedge a bond portfolio?

16.5d What is the cheapest-to-deliver option?

16.6 Summary and Conclusions

This chapter surveyed the basics of futures contracts. In it, we saw that:

1. A forward contract is an agreement between a buyer and a seller for a future commodity transaction at a price set today. Futures contracts are a step beyond forward contracts. Futures contracts and forward contracts accomplish the same task, but a forward contract can be struck between any two parties, while standardized futures contracts are managed through organized futures exchanges.

2. Commodity futures call for delivery of a physical commodity. Financial futures require delivery of a financial instrument or, in some cases, cash. Futures contracts are a type of derivative security, because the value of the contract is derived from the value of an underlying instrument.

3. Hedging is the major economic reason for the existence of futures markets. However, a viable futures market requires participation by both hedgers and speculators. Hedgers transfer price risk to speculators, and speculators absorb price risk. Hedging and speculating are thus complementary activities.

4. Futures trading accounts have three essential features: margin is required, futures accounts are marked to market daily, and a futures position can be closed out any time by a reverse trade.

5. The cash price of a commodity or financial instrument is the price quoted for current delivery. The cash price is also called the spot price.

6. The difference between a cash price and a futures price is called basis. For commodities with storage costs, the cash price is usually less than the futures price. This is referred to as a carrying-charge market. Sometimes the cash price is greater than the futures price, and this case is referred to as an inverted market.

7. There is a simple relationship between cash and futures prices knows as spot-futures parity. Violations of parity give rise to arbitrage opportunities, including index arbitrage, which involves stock index futures.

8. Cross-hedging refers to using futures contracts on a related commodity or instrument to hedge a particular spot position. Stock index futures, for example, can be used to hedge an equities portfolio against general declines in stock prices. U.S. Treasury note futures can be used to hedge a bond portfolio.

Key Terms

cash price

spot price

cash market

spot market

long position

short position

speculator

hedger

index arbitrage

long hedge

short hedge

cross-hedge

initial margin

maintenance margin

forward contract

futures contract

futures price

cash-futures arbitrage

basis

carrying-charge market

inverted market

spot-futures parity

program trading

cheapest to deliver option

futures margin

marking to market

reverse trade

margin call

Get Real!

This chapter covered the essentials of what many consider to be a complex subject, futures contracts. As we hope you realize, futures contracts per se are not complicated at all; in fact, they are, for the most part, quite simple. This doesn't mean that they're for everybody, of course. Because of the tremendous leverage possible, very large gains and losses can (and do) occur with great speed.

To experience some of the gains and losses from outright speculation, you should buy and sell a variety of contracts in a simulated brokerage account such as Stock-Trak. Be sure to go both long and short and pick a few of each major type of contract.

As we discussed, in addition to speculation, futures contracts are enormously useful as a hedging tool. Try using the S&P contract to hedge your stock portfolio for a week or two. To determine the number of contracts, you will either need to calculate your stock portfolio's beta or just assume your portfolio has a beta of 1. Either way, you will sell contracts. Next, observe how well the hedge works. As a practical matter (as long as the number of contracts is in the right ballpark), you will likely find that the hedge is quite effective.

Similarly, try using T-bond contracts to hedge your bond portfolio. Here you need to know two durations, but you can just assume the needed durations are equal to about 10 for the T-bond contract and, assuming you own long-term bonds, maybe 9 for your bond portfolio. Once again, as a practical matter, you will probably find that the hedge is quite effective in reducing both your losses and your gains.

STOCK-TRAK FAST TRACK

TRADING COMMODITY FUTURES WITH STOCK-TRAK

Commodity futures trading is popular among many individual investors. Stock-Trak allows its customers to trade a large number of different commodities futures: corn, wheat, gold, silver, oil, and many others. If you are interested in trying your hand at commodities trading with Stock-Trak, simply select the commodities you wish to trade from the *Wall Street Journal* "Futures" column, and then note the contract size for those commodities before deciding how many contracts you wish to trade. Table ST.1 lists contract sizes and ticker symbols for some popular commodities futures contracts.

Table ST.1 Commodity Futures Contract Size and Tickers

Instrument	**Ticker**	**Instrument**	**Ticker**
Corn (5,000 bushels)	C	Copper (25,000 lbs.)	HG
Soybeans (5,000 bushels)	S	Gold (100 ozs.)	GC
Wheat (5,000 bushels)	W	Platinum (50 ozs.)	PL
Coffee (37,500 lbs.)	KC	Crude Oil (1,000 bbl.)	CL
Sugar (112,000 lbs.)	SB	Heating Oil (42,000 gals.)	HO
Orange Juice (15,000 lbs.)	JO	Unleaded Gas (42,000 gals.)	HU

Suppose you wish to take a long position in 100,000 pounds of copper in the hope that copper prices will go up, and at the same time assume a short position in 300,000 pounds of coffee in the belief that coffee prices are about to fall. You would then buy four copper contracts and sell eight coffee contracts. But before submitting these orders, you must decide on a contract maturity month. For Stock-Trak trading, it is convenient to pick a month at or after the end of the semester, say, December or June.

Commodity futures tickers have two-character extensions denoting the contract expiration date. The first character is a letter representing the expiration month, and the second character is a number representing the expiration year. Futures ticker extensions for contracts expiring in 1999 are specified in Table ST.2 shown immediately below.

Table ST.2 Futures Ticker Extension Codes

(1999 expirations)

Expiration month	**Code**	**Expiration month**	
January	F9	July	N9
February	G9	August	Q9
March	H9	September	U9
April	J9	October	V9
May	K9	November	X9
June	M9	December	Z9

There are four basic types of futures trades; these are

1. Buy to open or increase a long position
2. Sell to open or increase a short position
3. Sell to close or decrease a long position
4. Buy to close or decrease a long position

Examples of the first two types of trades are orders to go long 4 June 1999 copper contracts and go short 8 December 2000 coffee contracts. Using standard futures ticker symbols, these orders are stated as:

Buy 4 C-M9 contracts

Sell 8 KC-Z0 contracts

Examples of the next two trade types are orders that close out these positions:

Sell 4 C-M9 contracts

Buy 8 KC-Z0 contracts

STOCK-TRAK EXERCISES

1. What are the complete tickers for the following commodity futures contracts: September 2000 Orange juice, March 1999 Unleaded gas, June 2001 gold?

TRADING STOCK INDEX FUTURES WITH STOCK-TRAK

Once you have mastered the basics of trading commodity futures, you may wish to begin trading stock index futures. Your Stock-Trak account allows you to trade futures on a number of different stock market indexes. To trade stock index futures, you first choose the stock index you want to use and find the ticker symbol for that index. You must also know the ticker extension for the maturity month of the futures contract.

The most popular stock market indexes are the Dow Jones Industrial Average (DJIA) and the Standard and Poor’s 500 (S&P 500). Futures contracts for the DJIA trade under the futures ticker symbol DJ. Futures contracts for the S&P 500 trade under the futures ticker symbol SP.

At the time this was written, the contract value for a single DJ futures contract was 10 times the underlying index level, and the contract value for the SP futures contract was 250 times the underlying index level. However, these contract values may change and you should consult the Stock-Trak website for the latest contract specifications. If you wish to know more detail about contract specifications, you should consult the Chicago Board of Trade website (www.cbot.com).

For example, suppose you go short a single DJ futures contract when the futures price is 10,150, and then at contract maturity the underlying index has a value of 10,025. Your dollar gain is then 10 × (10,150 - 10,025) = $1,250. Alternatively, suppose you go long a single SP futures contract when the futures price is 1310, and then at contract maturity the S&P 500 index is at 1302. Your dollar loss is then 250 × (1310 - 1302) = $2,000.

Futures tickers for stock indexes have a two-character extension denoting the contract expiration date. Just like commodity futures, the first character is a letter representing the expiration month, and the second character is an integer representing the expiration year. Futures ticker extensions for contracts expiring in 2000 are listed in Table ST.3.

Table ST.3 Futures Ticker Extension Codes (2000 expirations)			
Expiration month	**Code**	**Expiration month**	
January	F0	July	N0
February	G0	August	Q0
March	H0	September	U0
April	J0	October	V0
May	K0	November	X0
June	M0	December	Z0

For example, orders to go long 2 DJ June 1999 futures contract and go short 4 SP December 2000 futures contracts are abbreviated as

Buy 2 DJ-M9 contracts

Sell 4 SP-Z0 contracts

STOCK-TRAK EXERCISES

1. What are the complete tickers for the following stock index futures contracts: DJIA March 1999, S&P 500 September 2000?

TRADING INTEREST RATE FUTURES WITH STOCK-TRAK

You can trade on interest rate changes using interest rate futures with your Stock-Trak account. The most widely used interest rate futures contracts are based on Eurodollar rates and rates on U.S. Treasury bills, notes, and bonds. To trade interest rate futures with Stock-Trak, you first select the desired instrument and the number of futures contracts. Table ST.4 lists futures contract sizes and ticker symbols for several interest rate contracts.

Table ST.4 Interest Rate Futures Contract Size and Tickers

Instrument	**Ticker**	**Instrument**	**Ticker**
5-year T-Note ($100,000)	FV	13-week T-bills ($1 million)	TB
10-year T-Note ($100,000)	TY	Eurodollar ($1 million)	ED
30-year T-Bond ($100,000)	US	Libor ($3 million)	EM

Currency futures tickers have two-character extensions denoting the contract expiration date. Just like commodity futures, the first character is a letter representing the expiration month, and the second character is an number representing the expiration year.

For example, orders to go long 3 Treasury bill June 1999 futures contracts and go short 2 Eurodollar December 2000 futures contracts are abbreviated as:

Buy 3 TB-M9 contracts

Sell 2 ED-Z0 contracts

Going long implies buying the underlying instrument and going short implies selling the underlying instrument. The futures price specifies the price paid upon delivery at contract expiration. Detailed contract specifications for interest rate futures are available at the Chicago Board of Trade website (www.cbot.com) and the Chicago Mercantile Exchange website (www.cme.com).

STOCK-TRAK EXERCISES

1. What are the complete tickers for the following interest rate futures contracts: 5-year Treasury note September 2000, Libor March 1999, 30-year Treasury bond June 2001?

2. Through the website for this text book (www.mhhe.com/cj), go to the Stock-Trak website and review the latest information about trading futures contracts through Stock-Trak.

Chapter 16
Futures Contracts

Questions and problems

Review Problems and Self-Test

1. **Futures Gains and Losses** Suppose you purchase 10 orange juice contracts today at the settle price of $1 per pound. How much do these 10 contracts cost you? If the settle price is lower tomorrow by two cents per pound, how much do you make or lose?

2. **Spot-Futures Parity** Suppose a futures contract exists on Microsoft stock, which is currently selling at $200 per share. The contract matures in two months, the risk-free rate is 5 percent annually. The current dividend yield on the stock is 0 percent. What does the parity relationship imply the futures price should be?

Answers to Self-Test Problems

1. If you go long (purchase) 10 contracts, you pay nothing today (you will be required to post margin, but a futures contract is an agreement to exchange cash for goods later, not today). If the settle prices drops by 2 cents per pound, you lose 15,000 pounds. (the contract size) × $.02 = $300 per contract. With ten contracts, you lose $3,000.

2. The spot-futures parity condition is

$$F = S(1 + r - d)^T,$$

where S is the spot price, r is the risk-free rate, d is the dividend yield, F is the futures price, and T is the time to expiration measured in years.

Plugging in the numbers we have, with zero for the dividend yield and 1/6 for the number of years (2 months out 12), gets us

$$F = \$200(1 + .05)^{1/6} = \$201.63$$

Test Your IQ (Investment Quotient)

1. Futures Exchanges Which of the following is the oldest and currently the mos t active futures exchange in the United States?

a. Kansas City Board of Trade (KBOT)
b. Chicago Mercantile Exchange (CME)
c. New York Mercantile Exchange (NYMX)
d. Chicago Board of Trade (CBOT)

2. Futures Exchanges The first financial futures contracts, introduced in 1972, were

a. currency futures at the CME
b. interest rate futures at the CBOT
c. stock index futures at the KBOT
d. wheat futures at the CBOT

3. Futures versus Forward Contracts Which of the following statements is true regarding the distinction between futures contracts and forward contracts?

a. futures contracts are exchange-traded, whereas forward contracts are OTC-traded
b. all else equal, forward prices are higher than futures prices
c. forward contracts are created from baskets of futures contracts
d. futures contracts are cash-settled at maturity, whereas forward contracts result in delivery

4. Futures versus Forward Contracts In which of the following ways do futures contracts differ from forward contracts? (*1993 CFA exam*)

I. Futures contracts are standardized
II. For futures, performance of each party is guaranteed by a clearinghouse
III. Futures contracts require a daily settling of any gains or losses

a. I and II only
b. I and III only
c. II and III only
d. I, II, and III

5. **Futures Margin** Initial margin for a futures contract is usually

a. regulated by the Federal reserve
b. less than 2 percent of contract value
c. in the range between 2 percent to 5 percent of contract value
d. in the range between 5 percent to 25 percent of contract value

6. **Futures Margin** Which of the following statements is false about futures account margin?

a. initial margin is higher than maintenance margin
b. a margin call results when account margin falls below maintenance margin
c. marking-to-market of account margin occurs daily
d. a margin call results when account margin falls below initial margin

7. **Futures Contracts** Which of the following contract terms changes daily during the life of a futures contract?

a. futures price
b. futures contract size
c. futures maturity date
d. underlying commodity

8. **Futures Trading Accounts** Which of the following is the least essential thing to know about a futures trading account?

a. margin is required
b. futures accounts are marked-to-market daily
c. a futures position can be closed by a reverse trade.
d. a commission is charged for each trade

9. **Futures Delivery** On the maturity date, stock index futures contracts require delivery of: (*1993 CFA exam*)

a. common stock
b. common stock plus accrued dividends
c. Treasury bills
d. cash

10. **Futures Delivery** On the maturity date, Treasury note futures contracts require delivery of:

a. Treasury notes plus accrued coupons over the life of the futures contract
b. Treasury notes
c. Treasury bills
d. cash

11. **Spot-Futures Parity** A Treasury bond futures contract has a quoted price of 100. The underlying bond has a coupon rate of 7 percent and the current market interest rate is 7 percent. Spot-futures parity then implies a cash bond price of

a. 93
b. 100
c. 107
d. 114

12. **Spot-Futures Parity** A stock index futures contract maturing in one year has a currently traded price of $1,000. The cash index has dividend yield of 2 percent and the interest rate is 5 percent. Spot-futures parity then implies a cash index level of

a. $933.33
b. $971.43
c. $1,071
d. $1,029

13. **Futures Hedging** You manage a $100 million stock portfolio with a beta of .8. Given a contract size of $100,000 for a stock index futures contract, how many contracts are needed to hedge your portfolio?

a. 8
b. 80
c. 800
d. 8,000

14. **Futures Hedging** You manage a $100 million bond portfolio with a duration of 9 years. You wish to hedge this portfolio against interest rate risk using T-bond futures with a contract size of $100,000 and a duration of 12 years. How many contracts are required?

a. 750
b. 1,000
c. 133
d. 1,333

15. **Futures Hedging** Which of the following is not an input needed to calculate the number of stock index futures contracts required to hedge a stock portfolio?

a. the value of the stock portfolio
b. the beta of the stock portfolio
c. the contract value of the index futures contract
d. the initial margin required for each futures contract

Questions and Problems

Core Questions

1. **Understanding Futures Quotations** Using Figure 16.1, answer the following questions:
a. How many exchanges trade wheat futures contracts?
b. If you have a position in 10 gold futures, what quantity of gold underlies your position?
c. If you are short 20 oat futures contracts and you opt to make delivery, what quantity of oats must you supply?
d. Which maturity of the unleaded gasoline contract has the largest open interest? Which one has the smallest open interest?

2. **Understanding Futures Quotations** Using Figure 16.1, answer the following questions:
a. What was the settle price for September 1999 corn futures on this date? What is the total dollar value of this contract at the close of trading for the day?
b. What was the settle price for March 1999 Treasury bond futures on this date? If you held 10 contracts, what is the total dollar value of your futures position?
c. Suppose you held an open position of 25 S&P Midcap 400 index futures on this day. What is the change in the total dollar value of your position for this day's trading? If you held a long position, would this represent a profit or a loss to you?
d. Suppose you are short 10 July 1999 soybean oil futures contracts. Would you have made a profit or a loss on this day?

3. **Futures Profits and Losses** You are long 20 March 1999 oats futures contracts. Calculate your dollar profit or loss from this trading day.

4. **Futures Profits and Losses** You are short 15 December 1999 corn futures contracts. Calculate your dollar profit or loss from this trading day.

5. **Futures Profits and Losses** You are short 30 June 1999 five-year Treasury note futures contracts. Calculate your profit or loss from this trading day.

6. **Hedging with Futures** Kellogg's, the breakfast cereal manufacturer, uses large quantities of corn in its manufacturing operation. Suppose the near-term weather forecast for the corn-producing states is drought-like conditions, so that corn prices are expected to rise. To hedge its costs, Kellogg's has decided to use the Chicago Board of Trade's corn futures contract. Should the company be a short hedger or a long hedger?

7. **Hedging with Futures** Suppose one of Fidelity's mutual funds closely mimics the S&P 500 index. The fund has done very well during the year, and, in November, the fund manager wants to lock in the gains he has made using stock index futures. Should he take a long or short position in S&P 500 index futures?

8. **Hedging with Futures** A mutual fund that predominantly holds long-term Treasury bonds plans on liquidating the portfolio in three months. However, the fund manager is concerned that interest rates may rise from current levels and wants to hedge the price risk of the portfolio. Should she buy or sell Treasury bond futures contracts?

9. **Hedging with Futures** An American electronics firm imports its completed circuit boards from Japan. The company signed a contract today to pay for the boards in Japanese yen upon delivery in four months; the price per board in yen was fixed in the contract. Should the importer buy or sell Japanese yen futures contracts?

10. **Hedging with Futures** Jed Clampett just dug another oil well, and, as usual, it's a gusher. Jed estimates that in two months, he'll have 2 million barrels of crude oil to bring to market. However, Jed would like to lock in the value of this oil at today's prices, since the oil market has been skyrocketing recently. Should Jed buy or sell crude oil futures contracts?

<u>Intermediate Questions</u>

11. **Open Interest** Referring to Figure 16.1, what is the total open interest on the Deutschemark contract? Does it represent long positions or short positions or both? Based on the settle price on the December contract, what is the dollar value of the open interest?

12. **Margin Call** Suppose the initial margin on heating oil futures is $1,000, the maintenance margin is $750 per contract, and you establish a long position of five contracts today (see Figure 16.1 for contract specifications). Tomorrow, the contract settles down .01, from .36 to .35. Are you subject to a margin call? What is the maximum price decline on the contract that you can sustain without getting a margin call?

13. **Future Markets** Is it true that a futures contract is a zero-sum game, meaning that the only way for a buyer to win is for a seller to lose, and vice versa?

14. **Marking-to-Market** You are short 20 gasoline futures contracts, established at an initial settle price of .545 (see Figure 16.1 for contract specifications). Your initial margin to establish the position is $1,200 per contract and the maintenance margin is $800 per contract. Over the subsequent four trading days, the settle price is .555, .560, .540, and .520, respectively. Compute the balance in your margin account at the end of each of the four trading days, and compute your total profit or loss at the end of the trading period.

15. **Spot-Futures Parity** Suppose a futures contract exists on IBM stock, which is currently selling at $90 per share. The contract matures in three months, the risk-free rate is 6 percent annually, and the current dividend yield on the stock is 4 percent. What does the parity relationship imply the futures price should be?

16. **Index Arbitrage** Suppose the CAC-40 index (a widely-followed index of French stock prices) is currently at 1800, the expected dividend yield on the index is 3 percent per year, and the risk-free rate in France is 6 percent annually. If the futures that expire in six months are currently trading at 1850, what program trading strategy would you recommend?

17. **Cross-Hedging** You have been assigned to implement a three-month hedge for a stock mutual fund portfolio that primarily invests in medium-sized companies. The mutual fund has a beta of 1.15 measured relative to the S&P Midcap 400, and the net asset value of the fund is $200 million. Should you be long or short in the futures contracts? Using the quotations in Figure 16.1 for the March contract, determine the appropriate number of futures to use in designing your cross-hedge strategy.

18. **Program Trading** Program traders closely monitor relative futures and cash market prices, but program trades are not actually made on a fully mechanical basis. What are some of the complications that might make program trading using, for example, the S&P 500 contract more difficult than the spot-futures parity formula indicates?

19. **Spot-Futures Parity** Suppose the 90-day S&P 500 futures price is 1200 while the cash price is 1,194. What is the implied difference between the risk-free interest rate and the dividend yield on the S&P 500?

20. **Hedging Interest Rate Risk** Suppose you want to hedge a $600 million bond portfolio with a duration of 6 years using 10-year Treasury note futures with a duration of 9 years, a futures price of 102, and 90 days to expiration. How many contracts do you buy or sell?

Chapter 16
Futures Contracts
Answers and solutions

Answers to Multiple Choice questions

1. **D**
2. **A**
3. **A**
4. **D**
5. **C**
6. **D**
7. **A**
8. **D**
9. **D**
10. **B**
11. **B**
12. **B**
13. **C**
14. **A**
15. **D**

Answers to Questions and Problems

Core Questions

1. a. Three are visible in Figure 16.1; wheat futures are traded on the Chicago Board of Trade (CBT), Kansas City Board of Trade (KC), and Minneapolis Grain Exchange (MPLS). There are two others, the Winnipeg Commodity Exchange (WPG) and the MidAmerica Commodity Exchange (MCE), not shown in Figure 16.1. Of these, the largest trading activity occurs in Chicago.

b. 100 troy oz., on the Comex division of the New York Mercantile Exchange (NYM).

c. At 5,000 bu. per contract, you must deliver 100,000 bushels.

d. The April contract has the largest open interest and the September contract has the smallest open interest.

2. a. The settle price is 231.75 cents per bushel. One contract is valued as the contract size times the per unit price, so 5,000 × $2.3175 = $11,587.5.

b. The settle price is 123-23, or 123.71875% of par value. The value of a position in 10 contracts is 10 × $100,000 × 1.2371875 = $1,237,187.5.

c. The index futures price was up 6.65 for the day, or $500 × 6.65 = $3,325. For a position in 25 contracts, this represents a change in value of 25 × $3,325 = $83,125, which would represent a loss to a long position and a profit to a short position.

d. The contract price closed down 5 for the day, so a short position would have made a profit of 10 × 5,000 × $0.05 = $2,500.

3. The contract settled down 1.75, so a long position loses: 20 × 5,000 × $0.0175 = $1,750.

4. The contract settled down .05, so a short position gains: 15 × 50,000 × $0.0005 = $375.

5. The contract settled down 24 points, so a short position profits: 30 × $100,000 × (24/3200) = $22,500.

6. Long hedge; i.e., buy corn futures. If corn prices do rise, then the futures position will show a profit, offsetting the losses from higher corn prices when they are purchased.

7. Short the index futures. If the S&P 500 index subsequently declines in a market sell-off, the futures position will show a profit, offsetting the losses on the portfolio of stocks.

8. Sell the futures. If interest rates rise, causing the value of the bonds to be less at the time of sale, the corresponding futures hedge will show a profit.

9. Buy yen futures. If the value of the dollar depreciates relative to the yen in the intervening four months, then the dollar/yen exchange rate will rise, and the payment required by the importer in dollars will rise. A long yen futures position would profit from the dollar's depreciation and offset the importer's higher invoice cost.

10. Sell crude oil futures. Price declines in the oil market would be offset by a gain on the short position.

Intermediate Questions

11. The total open interest on the D-mark is 125,970 contracts. This is the number of contracts. Each contract has a long and a short, so the open interest is represents either the number of long positions or the number of short positions. Each contract calls for the delivery of DM 125,000, and the settle price on the December contract is $.5412 per mark, or $.5412 × 125,000 = $67,650. With 125,970 contracts, the total dollar value is about $8.5 billion.

12. If the contract settles down, a long position loses money. The loss per contract is: 42,000 × $.01 = $420, so when the account is marked-to-market and settled at the end of the trading day, your balance is $580, which is less than the maintenance margin. The minimum price change for a margin call is $250 = 42,000 × *X*, or *X* = $.00595 = 0.595 cents per pound.

13. It is true. Each contract has a buyer and a seller, a long and a short. One side can only profit at the expense of the other. Including commissions, futures contracts, like most derivative assets, are actually negative sum gains. This doesn't make them inappropriate tools, by the way; it just means that, on average and before commissions, they are a break-even proposition.

14. Establish your account at an initial margin of 20 × $1,200 = $24,000. Your maintenance margin is 20 × $800 = $16,000. The initial value of the position is 20 × 42,000 × $0.545 = $457,800.

Day 1: New position value = 20 × 42,000 × $0.555 = $466,200, for a loss of $8,400. Your margin account balance is now $15,600, so you face a margin call. Put another $8,400 in your account to bring it up.

Day 2: New position value = 20 × 42,000 × $0.560 = $470,400, for a loss of $4,200. Your margin account balance is now $19,800.

Day 3: New position value = 20 × 42,000 × $0.540 = $453,600, for a profit of $16,800. Your margin account balance is now $36,600

Day 4: New position value = 20 × 42,000 × $0.520 = $436,800, for a profit of $16,800. Your margin account balance is now $53,400.

Your total profit is thus $53,400 - $8,400 - $24,000 = $21,000

15. $F = \$90(1 + .06 - .04)^{1/4} = \$90.45$

16. Parity implies that $F = 1{,}800(1 + .06 - .03)^{1/2} = 1{,}826.80$. If the parity relationship holds, the futures price should be At 1,850, the futures are currently overpriced; thus, you would want to buy the index and sell the futures.

17. The closing value of the Midcap 400 index futures is 316.9 × $500 = $158,450, so the desired hedge is 1.15 × $200M/$158,450 = 1,452. contracts. Assuming the mutual fund is long stocks, the likely hedge would then be to sell 1,452 Midcap 400 futures. Note however, that the Midcap 400 futures might not be liquid enough to handle such a large hedge, at least at this time. Also note that this contract expires in one month, so it will be necessary to "roll" the hedge into a subsequent contract once trading commences, meaning that the hedge will have to be recreated once a contract with a more distant maturity starts trading.

18. In reality, two factors in particular make stock index arbitrage more difficult than it might appear. First, the dividend yield on the index depends on the dividends that will be paid over the life of the contract; this is not known with certainty and must, therefore, be estimated. Second, buying or selling the entire index is feasible, but index staleness (discussed in our first stock market chapter) is an issue; the current up-to-the-second price of the index is not known because not all components will have just traded. Trading costs have considered as well.

Thus, there is some risk in that the inputs used to determine the correct futures price may be incorrect, and what appears to be a profitable trade really is not. Program traders usually establish bounds, meaning that no trade is undertaken unless a deviation from parity exceeds a preset amount. Setting the bounds is itself an issue. If they are set too narrow, then the risks described above exist. If they are set too wide, other traders will step in sooner and eliminate the profit opportunity.

19. The spot-futures parity condition is:

$$F = S(1 + r - d)^T,$$

where S is the spot price, r is the risk-free rate, d is the dividend yield, F is the futures price, and T is the time to expiration measured in years.

Plugging in the numbers we have, with 1/2 for the number of years (6 months out 12), gets us:

$$1200 = 1194(1 + X)^{1/2}$$

Solving for X, the difference between r and d, we get 1 percent.

20. The formula for the number of U.S. Treasury note futures contracts needed to hedge a bond portfolio is:

$$\text{Number of contracts} = \frac{D_P \times V_P}{D_F \times V_F} \qquad [16.8]$$

where V_P is the value of the bond portfolio,
D_P is the duration of the bond portfolio,
D_F is the duration of the futures contract,
V_F is the value of a single futures contract.

The duration of the futures contract is the duration of the underlying instrument, plus the time remaining until contract maturity, i.e.,

$$D_F = D_U + M_F$$

where D_F is the duration of the futures contract,
D_U is the duration of the underlying instrument, and
M_F is the time remaining until contract maturity.

In our case, the duration of the underlying U.S. Treasury note is 9 years and the futures contract has 90 days to run, so D_F = 9.25. The face value of the note contract is 102 percent of $100,000, or $102,000. Plugging in the numbers, we have:

$$3{,}816 \text{ contracts} = \frac{6 \times \$600{,}000{,}000}{9.25 \times \$120{,}000}$$

You therefore need to sell 3,816 contracts to hedge this $600 million portfolio.

Figure 16.1

FUTURES PRICES

Friday, August 1, 1997.

Open Interest Reflects Previous Trading Day.

GRAINS AND OILSEEDS

CORN (CBT) 5,000 bu.; cents per bu.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	265	270	263½	268½	+3	335	227½	59,704
Dec	267¾	269½	265¼	269	+1¼	310	227½	150,631
Mr98	275¼	277	273½	276¾	+1	305	236	30,136
May	279	281¼	278¼	281	+¾	303	241¾	6,542
July	281½	284¼	281¼	284	+1¾	315½	245	11,018
Sept	266¼	269½	266¼	267¾	+1¼	269½	244	1,354
Dec	269½	270¼	268½	268¾	-1¾	293	247	6,180

Est vol 80,000; vol Thu 105,883; open int 265,640, +3,735.

OATS (CBT) 5,000 bu.; cents per bu.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	168¾	169	167	167½	-1¾	185	144	2,146
Dec	168½	169	166	167	-2¼	183	143	5,347
Mr98	172¼	173½	170½	171¾	-1¾	174½	148¼	681

Est vol 1,500; vol Thu 2,075; open int 8,223, +301.

SOYBEANS (CBT) 5,000 bu.; cents per bu.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	766¼	773	758	762	-6	869½	663	13,938
Sept	685	688	679	683¾	-1¼	803¾	605	17,014
Nov	658	660½	651	655½	-2½	750	577	73,733
Ja98	660	663	654½	659¾	....	752	583	15,989
Mar	669½	669¾	663½	667¾	-1¾	749	593	5,314
May	671	675	669	671½	-3½	745	601	3,822
July	684	684	673½	679½	-½	751	611½	2,706
Nov	634½	638	634	637	+1	702	597	918

Est vol 55,000; vol Thu 70,000; open int 133,440, -2,590.

SOYBEAN MEAL (CBT) 100 tons; $ per ton.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	258.40	259.00	255.50	256.00	-2.40	283.80	203.50	14,839
Sept	234.00	235.20	232.70	233.00	-.80	262.50	201.50	19,787
Oct	220.50	222.50	218.50	220.70	-.80	240.00	193.00	15,522
Dec	215.20	217.50	212.80	216.60	+1.40	234.00	186.00	38,547
Ja98	213.50	215.00	211.00	214.20	+1.70	230.00	185.50	5,794
Mar	208.00	212.50	208.00	211.70	+2.60	227.00	184.50	8,059
May	208.00	211.50	208.00	211.00	+2.50	222.00	185.50	3,649
July	209.00	213.50	209.00	212.70	+2.00	217.00	188.50	2,196

Est vol 25,000; vol Thu 28,761; open int 108,565, -738.

SOYBEAN OIL (CBT) 60,000 lbs.; cents per lb.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	22.42	22.42	21.91	22.08	-.27	28.90	21.40	4,448
Sept	22.60	22.60	22.07	22.28	-.28	28.45	21.59	21,134
Oct	22.65	22.68	22.22	22.42	-.31	27.70	21.68	16,134
Dec	23.05	23.05	22.45	22.74	-.33	27.50	21.80	43,508
Ja98	23.15	23.18	22.70	22.90	-.28	27.45	21.98	6,336
Mar	23.45	23.48	23.10	23.23	-.24	27.50	22.20	4,175
May	23.60	23.60	23.25	23.30	-.25	27.55	22.35	1,667
July	23.55	23.75	23.35	23.40	-.30	27.40	22.40	1,339

Est vol 25,000; vol Thu 32,350; open int 99,146, +1,704.

WHEAT (CBT) 5,000 bu.; cents per bu.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	362	363½	358	361½	-½	463	321	40,964
Dec	376¾	378	372	376½	....	473½	334¾	44,442
Mr98	386	388	382	387¾	+1¾	470	343¾	11,770
May	385	389	383	388½	+4½	439½	345½	1,265
July	378	380	375	380	+2	425	333	4,545

Est vol 20,000; vol Thu 26,359; open int 103,008, +859.

WHEAT (KC) 5,000 bu.; cents per bu.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	367½	372	367½	368½	-2¾	498	325	27,480
Dec	384	387½	382½	384	-2¼	498	340	21,347
Mr98	391	396	390	392¼	-¼	491	350	6,249
May	388	388	388	389	-1	450	350	1,284

Est vol 5,537; vol Thu 9,424; open int 57,947, +1,249.

WHEAT (MPLS) 5,000 bu.; cents per bu.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	390½	393	388½	391½	-1½	479½	340	9,630
Dec	398	399	394	398½	-2½	479	349	7,307
Mr98	403	404	400	404	-1	469	361	1,821
May	....	....	....	404	....	440	363	107

Est vol 2,861; vol Thu 4,292; open int 18,885, +446.

CANOLA (WPG) 20 metric tons; Can. $ per ton

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	356.00	367.50	356.00	366.20	+8.30	447.00	340.50	1,580
Sept	354.00	357.20	351.60	357.20	+6.20	406.00	331.50	1,495
Nov	352.70	359.50	352.00	359.20	+5.50	410.00	332.20	26,642
Ja98	358.00	364.00	358.00	364.00	+5.20	393.70	337.00	1,972
Mar	364.80	364.80	364.00	364.00	+4.90	389.00	339.00	400

Est vol 4,355; vol Th 4,313; open int 32,149, -204.

WHEAT (WPG) 20 metric tons; Can. $ per ton

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Oct	153.00	153.30	152.80	152.80	-1.20	171.50	147.40	5,017
Dec	153.00	153.30	152.60	152.80	-1.00	171.50	147.80	3,761
Mr98	....	....	....	154.00	-3.50	172.00	150.00	1,642
May	....	....	....	156.10	-1.40	169.50	152.50	320

Est vol 480; vol Th 348; open int 10,740, -37.

BARLEY-WESTERN (WPG) 20 metric tons; Can. $ per ton

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Oct	129.30	129.80	128.50	128.80	-1.40	158.00	121.70	5,507
Dec	130.50	131.00	130.10	130.10	-1.60	143.00	123.50	4,352
Mr98	131.50	132.00	131.50	132.00	-.20	141.20	126.30	392

Est vol 600; vol Th 936; open int 10,256, +306.

LIVESTOCK AND MEAT

CATTLE-FEEDER (CME) 50,000 lbs.; cents per lb.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	82.00	82.35	81.25	81.52	-.10	83.40	64.05	8,533
Sept	82.40	82.50	81.30	81.35	-.37	82.95	65.60	3,623
Oct	82.10	82.47	81.35	81.50	-.35	83.15	66.10	5,798
Nov	83.45	83.70	82.50	82.62	-.40	84.30	67.95	3,526
Ja98	83.30	83.50	82.50	82.60	-.42	84.95	76.25	1,842
Mar	82.97	82.97	82.25	82.30	-.40	84.50	76.00	852
Apr	82.55	82.55	81.80	81.80	-.65	84.45	77.75	216
May	82.60	82.60	82.00	82.12	-.72	84.25	78.25	183

Est vol 3,211; vol Th 3,500; open int 24,573, -86.

CATTLE-LIVE (CME) 40,000 lbs.; cents per lb.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	67.90	68.00	67.47	67.52	-.30	68.32	62.00	20,057
Oct	70.80	70.92	70.35	70.52	-.10	71.45	64.55	49,275
Dec	72.57	72.62	72.27	72.57	+.07	73.02	65.25	20,607
Fb98	73.50	73.57	73.27	73.55	+.02	73.92	67.50	9,732
Apr	75.07	75.25	74.92	75.15	+.05	75.55	72.00	3,699
June	71.90	72.05	71.67	71.82	+.05	72.37	68.50	2,814
Aug	71.55	71.65	71.15	71.15	-.17	72.15	68.80	343

Est vol 11,961; vol Th 14,847; open int 106,527, +357.

HOGS (CME) 40,000 lbs.; cents per lb.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	81.92	82.45	81.45	82.17	+.25	84.45	66.00	9,148
Oct	75.35	75.70	74.82	75.57	+.42	77.00	60.60	16,605
Dec	71.15	71.45	70.80	71.20	....	73.90	60.10	5,962
Fb98	69.45	69.75	69.20	69.70	+.02	71.90	61.75	2,246
Apr	64.75	65.20	64.60	64.72	-.42	68.15	57.00	1,409
June	69.00	69.15	68.05	68.05	-.60	73.70	62.50	783
July	67.00	67.05	66.50	66.70	-.20	71.75	63.60	520
Aug	65.10	65.10	64.70	64.80	-.60	69.70	62.17	103
Oct	60.15	60.15	60.00	60.00	-.85	66.00	58.00	146

Est vol 8,146; vol Th 9,269; open int 36,942, +243.

PORK BELLIES (CME) 40,000 lbs.; cents per lb.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	86.50	88.75	85.30	88.00	+1.80	93.85	65.45	2,785
Fb98	77.20	78.20	76.00	77.85	+1.30	81.02	66.90	2,947

Est vol 3,803; vol Th 3,364; open int 5,836, +137.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
May	20.07	20.17	20.06	20.25	+0.11	20.95	17.39	7,667
June	20.04	20.17	20.02	20.23	+0.11	20.90	17.17	25,903
July	....	....	....	20.18	+0.11	20.65	17.60	7,642
Aug	19.93	20.05	19.93	20.14	+0.11	20.57	18.80	11,648
Sept	19.97	19.97	19.97	20.10	+0.11	20.55	17.94	4,247
Oct	19.90	19.90	19.90	20.06	+0.10	20.55	17.75	2,188
Nov	19.93	19.93	19.93	20.03	+0.10	20.53	19.22	1,191
Dec	19.80	19.82	19.80	20.01	+0.10	20.65	17.05	24,317
Ja99	....	....	....	20.01	+0.10	20.13	17.85	11,063
Feb	....	....	....	20.01	+0.10	20.32	19.28	5,575
Mar	....	....	....	20.01	+0.10	20.14	18.70	1,554
Apr	....	....	....	20.01	+0.10	20.27	19.60	1,419
May	....	....	....	20.01	+0.10	20.29	19.82	300
June	....	....	....	20.01	+0.10	20.47	17.80	6,161
July	....	....	....	20.01	+0.10	20.14	19.70	875
Aug	....	....	....	20.01	+0.10	....	....	192
Sept	....	....	....	20.01	+0.10	20.00	20.00	510
Dec	....	....	....	20.01	+0.10	20.75	17.62	15,013
Dc00	....	....	....	20.07	+0.10	20.75	19.05	2,802
Dc01	....	....	....	20.13	+0.10	20.98	19.58	3,040
Dc02	....	....	....	20.19	+0.10	21.38	19.80	1,376
Dc03	....	....	....	20.27	+0.10	22.00	19.90	1,716

Est vol 71,507; vol Thu 140,700; open int 424,170, +1,652.

HEATING OIL NO. 2 (NYM) 42,000 gal.; $ per gal.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	.5560	.5680	.5555	.5656	+.0037	.6110	.4940	43,130
Oct	.5680	.5720	.5625	.5708	+.0029	.6200	.5050	26,156
Nov	.5695	.5775	.5695	.5773	+.0024	.6180	.5075	17,243
Dec	.5800	.5840	.5770	.5838	+.0019	.6205	.5179	16,542
Ja98	.5880	.5880	.5815	.5868	+.0014	.6205	.5240	15,130
Feb	.5810	.5840	.5800	.5853	+.0014	.6150	.5425	8,507
Mar	.5725	.5750	.5700	.5753	+.0009	.5960	.5250	7,010
Apr	....	....	....	.5598	+.0004	.5820	.5350	3,175
May	....	....	....	.5473	-.0001	.5710	.5250	1,695
June	.5445	.5445	.5445	.5438	-.0006	.5625	.5240	3,461
July	....	....	....	.5438	-.0016	.5650	.5265	1,220
Aug	....	....	....	.5483	-.0021	.5650	.5320	409

Est vol 23,884; vol Thu 52,654; open int 146,967, -4,239.

GASOLINE-NY Unleaded (NYM)) 42,000 gal.; $ per gal.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	.6300	.6530	.6240	.6507	+.0227	.6530	.5435	39,781
Oct	.5930	.6050	.5900	.6037	+.0112	.6265	.5360	13,409
Nov	.5770	.5810	.5740	.5837	+.0079	.6030	.5350	7,210
Dec	.5710	.5750	.5690	.5762	+.0064	.6045	.5330	8,570
Ja98	.5720	.5740	.5690	.5757	+.0052	.5870	.5330	7,367
Feb	....	....	....	.5784	+.0044	.5900	.5375	1,984
Mar	....	....	....	.5834	+.0044	.5995	.5500	3,707

Est vol 37,082; vol Thu 55,604; open int 88,429, -4,145.

NATURAL GAS, (NYM) 10,000 MMBtu.; $ per MMBtu's

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	2.180	2.250	2.175	2.239	+.062	2.380	1.731	37,106
Oct	2.180	2.260	2.170	2.245	+.069	2.389	1.880	23,791
Nov	2.300	2.370	2.295	2.360	+.057	2.485	1.945	12,737
Dec	2.440	2.470	2.430	2.480	+.045	2.590	1.915	15,758
Ja98	2.472	2.500	2.470	2.505	+.042	2.635	2.075	17,115
Feb	2.385	2.395	2.380	2.417	+.037	2.535	2.010	11,507
Mar	2.280	2.285	2.270	2.300	+.030	2.400	1.930	7,351
Apr	2.145	2.155	2.145	2.165	+.025	2.270	1.825	3,899
May	2.095	2.110	2.095	2.117	+.022	2.232	1.830	3,248
June	2.080	2.095	2.080	2.100	+.020	2.220	1.745	5,105
July	2.072	2.085	2.072	2.090	+.015	2.205	1.852	4,424
Aug	2.075	2.085	2.075	2.085	+.010	2.210	1.845	3,965
Sept	2.075	2.080	2.075	2.082	+.007	2.220	1.850	2,595
Oct	2.085	2.085	2.085	2.095	+.005	2.227	1.840	2,145
Nov	....	....	....	2.184	+.001	2.310	1.915	1,424
Dec	2.291	2.291	2.291	2.291	....	2.420	1.950	3,071
Ja99	....	....	....	2.325	....	2.425	2.085	3,667
Feb	....	....	....	2.252	-.001	2.378	2.025	2,110
Mar	....	....	....	2.169	-.002	2.315	1.945	2,376
Apr	....	....	....	2.076	-.003	2.273	1.910	1,206
May	....	....	....	2.052	-.004	2.270	1.960	1,973
June	....	....	....	2.053	-.005	2.300	1.860	1,983
July	....	....	....	2.044	-.006	2.276	1.960	1,811
Aug	....	....	....	2.041	-.007	2.155	1.975	1,916
Sept	....	....	....	2.038	-.008	2.160	1.970	2,082
Oct	....	....	....	2.055	-.009	2.102	2.042	1,286
Nov	....	....	....	2.150	-.010	2.265	2.160	807
Dec	....	....	....	2.270	-.010	2.465	2.213	3,332
Ja00	....	....	....	2.300	-.010	2.459	2.310	979
Mar	2.140	2.140	2.140	2.140	-.010	2.216	2.119	438

Est vol 19,161; vol Thu 38,622; open int 182,662, -16.

BRENT CRUDE (IPE) 1,000 net bbls.; $ per bbl.

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	18.76	19.00	18.63	18.95	+.01	20.84	17.60	65,989
Oct	18.80	19.00	18.68	18.97	+.05	20.35	17.89	45,933
Nov	18.83	19.04	18.80	19.03	+.04	20.19	18.05	12,821
Dec	18.88	19.08	18.86	19.08	+.01	20.22	18.10	17,576
Ja98	18.96	19.06	18.89	19.07	....	20.10	18.18	14,355
Feb	18.94	19.05	18.94	19.04	+.01	19.89	18.18	6,019
Mar	....	....	....	19.00	+.02	19.71	18.24	2,717
Apr	18.96	18.96	18.96	18.97	+.03	19.70	18.24	1,355
May	18.74	18.75	18.74	18.93	+.04	19.58	18.33	2,514
June	18.70	18.70	18.70	18.90	+.05	19.09	18.10	2,789
July	....	....	....	18.86	+.06	18.34	18.32	1,750
Aug	18.60	18.60	18.60	18.83	+.07	18.71	18.60	300

Est vol 26,585; vol Th 46,725; open int 174,118, -685.

GAS OIL (IPE) 100 metric tons; $ per ton

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	170.25	172.25	169.00	171.50	+2.25	190.75	160.00	18,245
Sept	171.25	173.50	170.25	173.00	+2.50	188.50	152.00	16,575
Oct	172.75	174.75	172.00	174.75	+2.50	188.50	164.25	9,759
Nov	174.50	175.50	173.75	175.50	+1.75	188.50	166.00	5,401
Dec	175.50	176.75	174.75	176.50	+1.50	187.75	160.50	12,329
Ja98	175.00	177.00	175.00	177.00	+1.75	186.50	169.00	7,697
Feb	175.50	176.50	175.50	176.25	+1.50	185.00	16925	5,061
Mar	174.00	174.50	174.00	174.50	+1.25	181.50	168.00	2,351
Apr	172.25	172.25	172.25	172.75	+1.25	180.25	168.25	578
May	....	....	....	171.25	+1.25	169.50	167.00	598
June	....	....	....	170.25	+1.25	177.50	163.50	3,295
July	....	....	....	170.75	+1.25	167.25	167.00	260
Sept	....	....	....	173.75	+1.25	171.00	171.00	146
Dec	....	....	....	178.75	+1.25	177.50	175.25	291

Est vol 11,568; vol Th 17,976; open int 82,586, +1,865.

CURRENCY

JAPAN YEN (CME)-12.5 million yen; $ per yen (.00)

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	.8484	.8540	.8443	.8498	+.0017	.9790	.7946	77,212
Dec	.8560	.8638	.8557	.8608	+.0018	.9320	.8135	1,975
Mr98	....	....	....	.8721	+.0019	.9375	.8269	413

Est vol 21,493; vol Th 18,244; open int 79,600, -148.

DEUTSCHEMARK (CME)-125,000 marks; $ per mark

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	.5453	.5457	.5369	.5380	-.0070	.6635	.5369	122,093
Dec	.5448	.5449	.5402	.5412	-.0070	.6610	.5402	3,225
Mr98	....	....	....	.5433	-.0070	.6160	.5494	545
June	....	....	....	.5474	-.0070	.5995	.5537	107

Est vol 38,118; vol Th 16,723; open int 125,970, -327.

	Open	High	Low	Settle	Chg	Yield Settle	Yield Chg	Open Interest
June	93.32	93.36	93.19	93.18	-.17	6.82	+.17	4,879
Sept	93.29	93.33	93.16	93.15	-.17	6.85	+.17	5,168
Dec	93.15	93.26	93.09	93.08	-.17	6.92	+.17	4,923
Mr04	93.21	93.26	93.09	93.08	-.17	6.92	+.17	4,694
June	93.12	93.23	93.06	93.05	-.17	6.95	+.17	6,399
Sept	93.09	93.20	93.02	93.02	-.17	6.98	+.17	3,776
Dec	93.08	93.13	92.95	92.95	-.17	7.05	+.17	4,724
Mr05	93.02	93.13	92.95	92.95	-.17	7.05	+.17	2,395
June	92.99	93.10	92.94	92.92	-.17	7.08	+.17	2,717
Sept	92.92	93.07	92.91	92.89	-.17	7.11	+.17	2,350
Dec	92.84	93.00	92.84	92.82	-.17	7.18	+.17	1,501
Mr06	....	....	....	92.82	-.17	7.18	+.17	2,292
June	....	....	....	92.79	-.17	7.21	+.17	1,243
Sept	....	....	....	92.76	-.17	7.24	+.17	1,182
Dec	....	....	....	92.69	-.17	7.31	+.17	1,298
Mr07	....	....	....	92.69	-.17	7.31	+.17	1,011

Est vol 994,578; vol Thu 551,930; open int 2,719,796, +6,990.

EUROYEN (CME)-Yen 100,000,000; pts. of 100%

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	99.37	99.37	99.36	99.36	-.01	99.39	97.50	11,322
Dec	99.32	99.32	99.30	99.30	....	99.31	97.30	12,665
Mr98	99.21	99.21	99.16	99.17	....	99.20	97.04	10,136
June	99.04	99.04	99.00	99.01	+.01	99.03	96.81	6,253
Sept	98.87	98.87	98.85	98.85	+.02	98.86	96.62	3,370
Dec	98.70	98.70	98.69	98.69	+.03	98.68	96.39	4,308
Mr99	....	....	....	98.52	+.03	98.51	96.67	2,602
June	98.40	98.40	98.37	98.36	+.02	98.37	97.45	783

Est vol 6,013; vol Thu 5,169; open int 51,998, +1,114.

STERLING (LIFFE)-£500,000; pts of 100%

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	92.71	92.71	92.67	92.68	-.04	93.54	89.92	127,863
Dec	92.56	92.58	92.49	92.51	-.06	93.35	90.10	123,448
Mr98	92.55	92.58	92.49	92.51	-.06	93.24	90.58	99,828
June	92.60	92.64	92.56	92.57	-.05	93.14	90.89	71,386
Sept	92.67	92.71	92.63	92.63	-.05	93.08	91.30	53,516
Dec	92.73	92.75	92.68	92.68	-.05	93.03	91.27	43,780
Mr99	92.75	92.80	92.72	92.72	-.05	92.98	91.45	40,365
June	92.78	92.82	92.74	92.74	-.04	92.92	91.53	27,675
Sept	92.79	92.82	92.75	92.75	-.04	92.87	91.92	16,764
Dec	92.81	92.81	92.81	92.75	-.03	92.83	91.94	14,151
Mr00	92.77	92.79	92.74	92.75	-.02	92.81	91.96	10,701
June	92.78	92.78	92.72	92.75	-.02	92.80	92.47	4,011

Est vol 115,134; vol Thu 75,313; open int 633,488, +7,797.

LONG GILT (LIFFE)-£50,000; 32nds of 100%

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	115-16	115-25	114-13	114-29	-0-17	116-02	108-00	184,449
Dec	114-18	114-20	114-18	114-17	-0-16	115-11	113-23	8,820

Est vol 102,519; vol Thu 79,309; open int 193,269, -2,023.

EUROMARK (LIFFE)-DM 1,000,000; pts of 100%

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Aug	96.75	96.75	96.74	96.74	-.02	96.87	96.74	1,053
Sept	96.69	96.70	96.64	96.66	-.04	96.87	92.06	272,856
Oct	96.61	96.61	96.60	96.60	-.02	96.74	96.60	1,528
Dec	96.55	96.55	96.47	96.48	-.06	96.79	91.94	302,255
Mr98	96.42	96.42	96.34	96.36	-.06	96.71	92.00	259,815
June	96.24	96.24	96.15	96.17	-.07	96.58	92.59	193,341
Sept	96.05	96.05	95.94	95.97	-.07	96.39	93.38	149,070
Dec	95.78	95.79	95.70	95.72	-.07	96.15	93.40	139,853
Mr99	95.56	95.59	95.50	95.52	-.07	95.91	93.24	103,535
June	95.38	95.40	95.30	95.32	-.08	95.71	93.29	65,068
Sept	95.24	95.24	95.17	95.17	-.07	95.50	93.80	50,383
Dec	95.08	95.08	95.00	95.00	-.07	95.30	94.19	44,260
Mr00	94.93	94.93	94.85	94.85	-.08	95.09	94.24	20,318
June	94.79	94.79	94.71	94.71	-.08	94.89	93.97	8,126
Sept	94.61	94.61	94.57	94.57	-.08	94.71	93.84	3,863
Dec	....	....	....	94.41	-.08	94.55	93.68	2,556
Mr01	94.30	94.30	94.30	94.27	-.08	94.40	93.50	897
June	94.17	94.17	94.17	94.14	-.08	94.25	93.85	1,175

Est vol 280,004; vol Thu 199,247; open int 1,619,952, -379.

EUROSWISS (LIFFE)-SFr 1,000,000; pts of 100%

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	98.45	98.48	98.44	98.46	+.01	98.77	96.28	58,473
Dec	98.30	98.33	98.28	98.31	+.01	98.57	96.02	45,200
Mr98	98.20	98.21	98.19	98.20	+.02	98.42	96.90	20,943
June	98.04	98.07	98.03	98.05	+.01	98.25	97.25	6,965
Sept	97.92	97.92	97.89	97.91	+.01	98.08	97.42	2,761
Dec	97.74	97.74	97.74	97.73	-.01	97.87	97.64	3,165

Est vol 10,163; vol Thu 15,782; open int 137,507, -286.

FOOD AND FIBER

COCOA (CSCE)-10 metric tons; $ per ton.

Sept	1,515	1,537	1,515	1,517	+ 4	1,737	1,319	23,223
Dec	1,564	1,582	1,559	1,564	+ 4	1,777	1,342	25,424
Mr98	1,601	1,610	1,597	1,598	+ 3	1,803	1,373	24,749
May	1,619	1,633	1,615	1,618	+ 3	1,817	1,399	10,970
July	1,638	1,638	1,638	1,636	+ 3	1,835	1,485	1,390
Sept		....	....	1,656	+ 3	1,836	1,456	3,743
Dec		....	....	1,671	+ 3	1,863	1,510	5,634
Mr99	1,704	1,705	1,704	1,704	+ 3	1,901	1,670	5,315
May		....	....	1,718	+ 3	1,911	1,870	568

Est vol 4,924; vol Th 6,964; open int 101,016, −351.

COFFEE (CSCE)-37,500 lbs.; cents per lb.

Sept	184.50	187.00	183.25	184.95	+ .45	277.00	95.00	10,367
Dec	162.00	163.50	162.00	162.30	− .25	226.00	97.00	6,374
Mr98	148.00	148.50	147.00	147.30	− .70	203.00	96.25	3,202
May	142.00	143.00	142.00	141.25	− 1.00	195.00	101.00	899
July	138.40	139.40	138.40	137.50	− 1.05	191.00	120.00	566
Sept	135.00	135.00	135.00	133.50	− .25	186.00	122.50	314

Est vol 2,636; vol Th 6,308; open int 21,794, −208.

SUGAR-WORLD (CSCE)-112,000 lbs.; cents per lb.

Oct	11.67	11.76	11.50	11.65	− .03	11.76	9.43	112,971
Mr98	11.88	11.94	11.72	11.84	− .04	11.96	10.13	56,877
May	11.83	11.87	11.70	11.80	− .02	11.89	10.20	12,667
July	11.72	11.75	11.60	11.69	− .02	11.80	10.30	7,068
Oct	11.65	11.66	11.53	11.61	− .02	11.74	10.45	2,946
Mr99	11.56	11.57	11.52	11.52	− .05	11.63	10.41	886

Est vol 23,544; vol Th 15,357; open int 193,470, +2,545.

SUGAR-DOMESTIC (CSCE)-112,000 lbs.; cents per lb.

Sept	22.30	22.47	22.30	22.46	+ .15	22.99	21.49	2,108
Nov	22.35	22.40	22.35	22.38	− .02	22.58	21.99	3,651
Ja98	22.37	22.43	22.35	22.35	− .05	22.53	22.02	3,298
Mar	22.34	22.34	22.34	22.34	− .04	22.51	22.05	2,318
May	22.48	22.48	22.48	22.48	+ .03	22.54	22.15	2,036
July		....	....	22.50	+ .01	22.53	22.36	1,523
Sept	22.48	22.48	22.48	22.48	+ .02	22.48	22.35	908

Est vol 250; vol Th 1,361; open int 15,926, +355.

COTTON (CTN)-50,000 lbs.; cents per lb.

Oct	75.07	75.25	74.60	75.18	+ .21	81.30	72.80	11,724
Dec	74.90	75.19	74.51	75.12	+ .07	80.10	73.20	43,106
Mr98	76.05	76.30	75.75	76.30	+ .05	81.00	74.41	10,661
May		....	....	76.90	+ .05	81.00	75.20	2,771
July		....	....	77.25	....	79.25	75.90	1,538
Oct	75.40	75.40	75.20	75.35	+ .02	78.00	74.40	522
Dec	74.20	74.20	74.10	74.15	− .05	76.55	73.30	5,330
Mr99	75.10	75.25	75.00	75.00	− .20	75.75	74.75	158

Est vol 8,000; vol Th 7,435; open int 75,810, +1,045.

ORANGE JUICE (CTN)-15,000 lbs.; cents per lb.

Sept	75.80	76.20	75.50	75.55	− .30	121.30	73.35	16,725
Nov	77.90	78.00	77.50	77.50	− .40	113.25	76.05	8,416
Ja98	80.70	80.70	80.45	80.50	− .30	119.75	79.10	3,703
Mar	83.85	83.85	83.45	83.45	− .45	100.25	82.05	2,518
May	86.65	86.65	86.65	86.20	− .45	97.50	85.00	707
July		....	....	88.90	− .50	105.00	88.00	190

Est vol 1,500; vol Th 5,376; open int 32,365, −261.

METALS AND PETROLEUM

COPPER-HIGH (Cmx.Div.NYM)-25,000 lbs.; cents per lb.

Aug	107.45	107.45	106.30	106.95	− 1.85	121.60	84.10	3,064
Sept	108.40	108.60	105.80	107.25	− 1.65	120.50	83.00	20,621
Oct		....	....	106.25	− 1.25	117.20	84.50	1,674
Nov	105.10	105.80	105.10	105.75	− 1.75	115.10	84.50	1,333
Dec	105.10	105.30	103.60	105.15	− 1.05	114.80	83.75	7,512
Ja98	104.25	104.70	104.25	104.65	− 1.05	112.00	85.20	642
Feb	103.50	103.50	103.10	103.85	− .85	106.30	85.50	621
Mar	103.00	103.10	102.65	103.05	− .65	113.00	85.00	2,399
Apr	102.00	102.20	102.00	102.20	− .60	108.00	86.00	387
May	101.00	101.15	101.00	101.65	− .55	106.75	85.00	1,208
June	100.00	100.00	100.00	100.65	− .55	103.65	35.40	372
July	99.75	99.75	99.75	100.25	− .55	104.10	84.80	834
Aug	99.25	99.25	99.25	99.45	− .55	102.00	85.60	258
Sept	98.50	99.50	98.50	98.90	− .55	102.10	84.70	555
Oct		....	....	98.35	− .55	99.40	92.75	107
Dec		....	....	97.65	− .55	102.00	91.00	672

Est vol 10,000; vol Th 7,364; open int 42,423, −717.

GOLD (Cmx.Div.NYM)-100 troy oz.; $ per troy oz.

Aug	324.30	326.00	323.30	324.70	+ .60	414.50	314.60	3,961
Oct	326.70	328.00	325.30	326.80	+ .30	426.50	316.80	14,880
Dec	328.90	330.10	327.30	328.90	+ .30	477.00	318.50	100,182
Fb98	331.00	331.60	330.00	331.20	+ .40	424.00	322.50	12,042
Apr	332.80	332.80	332.80	333.20	+ .40	408.40	325.00	5,177
June		....	....	335.50	+ .50	489.50	327.50	7,675
Aug		....	....	337.80	+ .50	403.80	339.30	3,111
Oct		....	....	340.10	+ .50	367.80	367.80	106
Dec		....	....	342.40	+ .50	505.00	334.50	6,039
Fb99		....	....	344.80	+ .50	....	....	1,132
Apr		....	....	347.10	+ .60	....	....	1,177
June		....	....	349.50	+ .70	520.00	365.00	6,355
Dec		....	....	356.70	+ .90	506.00	351.00	3,959
Ju00		....	....	364.00	+ 1.00	473.50	359.00	4,446
Dec		....	....	371.30	+ 1.10	474.50	362.00	6,500
Ju01		....	....	378.60	+ 1.20	447.00	447.00	2,054
Dec		....	....	385.90	+ 1.30	429.50	379.50	4,772
Ju02		....	....	393.20	+ 1.40	....	....	1,537

Est vol 31,000; vol Th 35,543; open int 184,713, −3,677.

PLATINUM (NYM)-50 troy oz.; $ per troy oz.

Oct	428.00	439.00	428.00	438.50	+ 13.00	439.00	355.50	11,326
Ja98	416.00	426.00	416.00	427.50	+ 15.00	426.00	360.00	2,347
Apr	408.00	416.00	408.00	419.50	+ 17.00	416.00	386.00	285

Est vol 2,916; vol Th 3,740; open int 13,958, +251.

SILVER (Cmx.Div.NYM)-5,000 troy oz.; cnts per troy oz.

Aug		....	....	444.9	− 2.0	....	....	400
Sept	448.0	450.0	442.0	447.0	− 2.0	576.0	414.5	58,873
Dec	454.5	456.5	448.5	453.5	− 1.9	695.0	424.0	17,846
Mr98	458.0	461.0	454.0	459.9	− 1.8	573.0	432.0	10,294
May	464.0	464.5	464.0	463.9	− 1.7	564.0	437.0	2,968
July		....	....	467.9	− 1.6	700.0	438.0	2,093
Sept		....	....	472.1	− 1.5	548.0	453.0	992
Dec		....	....	478.6	− 1.4	734.0	448.5	1,416
Mr99		....	....	485.2	− 1.4	489.0	473.0	210
July	494.0	494.0	494.0	493.8	− 1.4	660.0	472.0	943
Dec		....	....	504.1	− .7	720.0	484.0	447
Jl00		....	....	519.1	− .7	590.0	538.0	905

Est vol 13,000; vol Th 25,479; open int 97,043, −117.

CRUDE OIL, Light Sweet (NYM) 1,000 bbls.; $ per bbl.

Sept	20.15	20.32	19.88	20.28	+ 0.14	22.30	16.71	97,128
Oct	20.20	20.34	19.96	20.31	+ 0.13	21.87	16.84	53,917
Nov	20.20	20.31	19.98	20.30	+ 0.13	21.60	16.90	33,441
Dec	20.20	20.30	20.02	20.29	+ 0.13	21.46	16.80	49,533
Ja98	20.15	20.32	20.03	20.27	+ 0.12	21.33	17.04	25,887
Feb	20.15	20.25	20.13	20.26	− 0.12	21.24	17.15	13,460
Mar	20.15	20.19	20.13	20.25	+ 0.11	21.14	17.30	6,618
Apr	20.05	20.19	20.04	20.25	+ 0.11	21.10	17.38	5,611

CANADIAN DOLLAR (CME)-100,000 dlrs.; $ per Can $

Sept	.7276	.7278	.7253	.7262	− .0013	.7662	.7196	41,469
Dec	.7311	.7315	.7288	.7296	− .0013	.7685	.7227	3,087
Mr98	....	....	....	.7324	− .0013	.7670	.7270	639
June	....	....	....	.7349	− .0013	.7470	.7300	174

Est vol 5,356; vol Th 5,972; open int 45,414, +432.

BRITISH POUND (CME)-62,500 pds.; $ per pound

Sept	1.6370	1.6400	1.6270	1.6284	− .0088	1.6960	1.5790	46,656
Dec	1.6306	1.6310	1.6200	1.6224	− .0088	1.6970	1.5800	842
Mr98		....	....	1.6166	− .0086	1.6840	1.6060	201

Est vol 8,151; vol Th 8,488; open int 47,699, −89.

SWISS FRANC (CME)-125,000 francs; $ per franc

Sept	.6648	.6648	.6568	.6581	− .0067	.8082	.6568	58,822
Dec	.6685	.6685	.6638	.6649	− .0057	.7740	.6638	2,180
Mr98	....	....	....	.6718	− .0057	.7450	.6895	967
June	....	....	....	.6788	− .0057	.7135	.7085	100

Est vol 16,218; vol Th 12,144 ; open int 62,069, −1,768.

AUSTRALIAN DOLLAR (CME)-100,000 dlrs.; $ per A.$

Sept	.7481	.7493	.7378	.7392	− .0075	.7890	.7322	16,662
Dec	.7400	.7400	.7400	.7407	− .0072	.7860	.7380	260

Est vol 1,542; vol Th 1,723; open int 16,925, −974.

MEXICAN PESO (CME)-500,000 new Mex. peso, $ per MP

Sept	.12550	.12590	.12507	.12522	− .0037	.12675	.10250	30,324
Dec	.12140	.12140	.12072	.12080	− .0040	.12240	.0985	13,510
Mr98	.11700	.11730	.11685	.11685	− .0040	.11840	.10400	5,212
June	.11370	.11370	.11350	.11365	− .0005	.11480	.10050	1,751
Sept	.11100	.11100	.11090	.11080	− .0042	.11250	.10575	244

Est vol 5,899; vol Th 7,947; open int 41,041, +751.

INTEREST RATE

TREASURY BONDS (CBT)-$100,000; pts. 32nds of 100%

	Open	High	Low	Settle	Change	Lifetime High	Lifetime Low	Open Interest
Sept	116-24	116-31	114-23	114-26	− 62	117-21	100-18	525,622
Dec	116-13	116-20	114-12	114-15	− 62	118-08	100-08	44,923
Mr98	116-07	116-07	114-05	114-05	− 62	116-26	104-21	32,089
June	....	....	....	113-25	− 62	116-14	104-03	2,132
Sept	....	....	....	113-15	− 61	115-00	103-22	823

Est vol 700,000; vol Thu 601,276; open int 606,440, +25,057.

TREASURY BONDS (MCE)-$50,000; pts. 32nds of 100%

Sept	116-29	116-31	114-23	114-28	− 60	116-31	105-31	15,996

Est vol 6,000; vol Thu 6,448; open int 16,021, −74.

TREASURY NOTES (CBT)-$100,000; pts. 32nds of 100%

Sept	111-01	111-04	109-27	109-28	− 36	111-12	104-21	378,139
Dec	110-27	110-27	109-19	109-19	− 37	110-27	104-10	23,536

Est vol 130,000; vol Thu 106,374; open int 402,447, +5,010.

5 YR TREAS NOTES (CBT)-$100,000; pts. 32nds of 100%

Sept	108-01	108-02	107-07	07-075	− 24.0	108-02	103-21	225,462
Dec	107-19	107-21	06-315	107-00	− 24.5	107-26	04-005	9,103

Est vol 75,000; vol Thu 51,389; open int 234,565, +1,539.

2 YR TREAS NOTES (CBT)-$200,000, pts. 32nds of 100%

Sept	03-242	03-245	03-145	03-145	− 9.3	103-25	01-305	40,420

Est vol 4,000; vol Thu 3,231; open int 40,980, +920.

30-DAY FEDERAL FUNDS (CBT)-$5 million; pts. of 100%

Aug	94.485	94.490	94.480	94.480	− .010	94.570	94.090	15,275
Sept	94.47	94.47	94.45	94.46	− .01	94.53	94.00	5,743
Oct	94.47	94.47	94.43	94.43	− .03	94.48	93.90	3,373
Nov	94.43	94.43	94.38	94.38	− .05	94.44	93.88	1,985
Dec	94.35	94.36	94.31	94.31	− .07	94.39	93.78	518

Est vol 5,555; vol Thu 3,854; open int 38,736, −35.

MUNI BOND INDEX (CBT)-$1,000; times Bond Buyer MBI

Sept	122-14	122-14	120-14	120-16	− 53	122-16	109-28	21,384

Est vol 5,000; vol Thu 2,918; open int 22,075, +127.
The Index: Close 121.23; yield 5.51.

TREASURY BILLS (CME)-$1 mil.; pts. of 100%

	Open	High	Low	Settle	Chg	Discount Settle	Discount Chg	Open Interest
Sept	94.96	94.96	94.89	94.90	− .04	5.11	+ .04	6,964
Dec	94.84	94.88	94.79	94.80	− .11	5.20	+ .11	777

Est vol 640; vol Thu 201; open int 7,784, −17.

LIBOR-1 MO. (CME)-$3,000,000; points of 100%

Aug	94.38	94.39	94.36	94.36	− .01	5.64	+ .01	21,818
Sept	94.38	94.39	94.34	94.35	− .03	5.65	+ .03	9,393
Oct	94.37	94.37	94.32	94.33	− .04	5.68	+ .04	4,433
Nov	94.33	94.35	94.29	94.29	− .06	5.71	+ .06	3,111
Dec	94.16	94.19	94.08	94.08	− .10	5.92	+ .10	1,405
Mr98	....	....	....	94.12	− .14	5.88	+ .14	310

Est vol 7,063; vol Thu 5,289; open int 40,966, −1,400.

EURODOLLAR (CME)-$1 million; pts of 100%

	Open	High	Low	Settle	Chg	Yield Settle	Yield Chg	Open Interest
Aug	94.31	94.32	94.28	94.28	− .03	5.72	+ .03	22,416
Sept	94.31	94.32	94.26	94.27	− .04	5.74	+ .04	523,254
Dec	94.22	94.24	94.10	94.11	− .11	5.89	+ .11	470,548
Mr98	94.18	94.19	94.02	94.03	− .15	5.97	+ .15	321,494
June	94.10	94.11	93.91	93.92	− .18	6.08	+ .18	257,339
Sept	94.01	94.03	93.82	93.83	− .18	6.17	+ .18	207,349
Dec	93.91	93.93	93.72	93.73	− .18	6.27	+ .18	167,054
Mr99	93.91	93.94	93.71	93.72	− .18	6.28	+ .18	124,597
June	93.87	93.89	93.67	93.68	− .19	6.32	+ .19	96,386
Sept	93.86	93.86	93.65	93.65	− .19	6.35	+ .19	82,692
Dec	93.78	93.79	93.58	93.59	− .18	6.41	+ .18	71,390
Mr00	93.78	93.79	93.58	93.59	− .18	6.41	+ .18	62,846
June	93.76	93.76	93.55	93.56	− .18	6.44	+ .18	45,647
Sept	93.73	93.73	93.52	93.53	− .18	6.47	+ .18	42,522
Dec	93.67	93.67	93.46	93.46	− .18	6.54	+ .18	33,513
Mr01	93.67	93.67	93.46	93.46	− .18	6.54	+ .18	31,517
June	93.64	93.64	93.43	93.43	− .18	6.57	+ .18	25,789
Sept	93.61	93.61	93.40	93.40	− .18	6.60	+ .18	19,192
Dec	93.53	93.53	93.33	93.34	− .17	6.66	+ .17	15,043
Mr02	93.53	93.53	93.33	93.34	− .17	6.66	+ .17	14,245
June	93.50	93.50	93.30	93.31	− .17	6.69	+ .17	11,498
Sept	93.33	93.46	93.29	93.28	− .17	6.72	+ .17	7,241
Dec	93.25	93.39	93.22	93.21	− .17	6.79	+ .17	6,897
Mr03	93.35	93.39	93.22	93.21	− .17	6.79	+ .17	5,351

EXCHANGE ABBREVIATIONS
(for commodity futures and futures options)

CBT-Chicago Board of Trade; CME-Chicago Mercantile Exchange; CSCE-Coffee, Sugar & Cocoa Exchange, New York; CMX-COMEX (Div. of New York Mercantile Exchange); CTN-New York Cotton Exchange; DTB-Deutsche Terminboerse; FINEX-Financial Exchange (Div. of New York Cotton Exchange; IPE-International Petroleum Exchange; KC-Kansas City Board of Trade; LIFFE-London International Financial Futures Exchange; MATIF-Marche a Terme International de France; ME-Montreal Exchange; MCE-MidAmerica Commodity Exchange; MPLS-Minneapolis Grain Exchange; NYFE-New York Futures Exchange (Sub. of New York Cotton Exchange); NYM-New York Mercantile Exchange; SIMEX-Singapore International Monetary Exchange Ltd.; SFE-Sydney Futures Exchange; TFE-Toronto Futures Exchange; WPG-Winnipeg CommodityExchange.

EUROYEN (SIMEX)-Yen 100,000,000 pts. of 100%

Sept	99.36	99.38	99.36	99.36	....	99.39	94.55	76,169
Dec	99.29	99.32	99.29	99.31	+ .15	99.32	94.78	128,479
Mr98	99.17	99.22	99.17	99.20	+ .30	99.22	95.65	101,240
June	99.01	99.07	99.01	99.05	+ .50	99.07	95.60	55,892
Sept	98.86	98.89	98.84	98.87	+ .50	98.89	96.50	37,662
Dec	98.67	98.71	98.67	98.70	+ .50	98.72	96.37	41,973
Mr99	98.51	98.55	98.51	98.54	+ .50	98.55	96.24	23,546
June	98.38	98.39	98.38	98.39	+ .50	98.40	96.65	7,527
Sept	98.22	98.24	98.22	98.24	+ .50	98.24	96.99	3,059
Dec	....	....	....	98.09	+ .50	98.98	97.23	1,537
Mr00	....	....	....	97.94	+ .50	97.92	97.10	775

Est vol 45,061; vol Th 62,564; open int 477,859, +6,984.

BOBL-MED.TERM BOND (DTB)-DM 250,000; DM per $

Sept	105.12	105.12	104.53	104.68	− .38	105.80	103.73	336,259
Dec	104.25	104.25	103.80	103.95	− .57	104.89	104.12	14,074

Est vol 154,795; vol Th 112,037; open int 350,333, +33,856.

INDEX

S&P 500 INDEX (CME) $500 times index

	Open	High	Low	Settle	Chg	High	Low	Open Interest
Sept	957.40	960.25	941.50	953.00	− 4.95	963.90	707.50	178,220
Dec	968.25	971.20	950.50	963.20	− 5.00	974.00	753.00	5,843
Mr98		....	....	973.65	− 4.90	971.50	762.20	1,919
June		....	....	984.35	− 4.65	981.50	873.00	674

Est vol 71,381; vol Th 57,704; open int 186,710, −850.
Indx prelim High 955.33; Low 939.05; Close 947.14−7.17

S&P MIDCAP 400 (CME) $500 times index

Sept	316.50	317.30	312.75	316.90	+ .80	317.40	248.80	11,989

Est vol 857; vol Th 938; open int 12,016, −20.
The Index: High 314.67; Low 314.71; Close 311.60−.73

NIKKEI 225 STOCK AVERAGE (CME)-$5 times index

Sept	19840.	19920.	19810.	19880.	− 495	22000.	17300.	18,009

Est vol 1,887; vol Th 447; open int 18,037, −80.
The Index: High 20399.14; Low 19797.58; Close 19804.38−527.05

NASDAQ 100 (CME)-$100 times index

Sept	111500	112400	110000	111875	+ 4.25	112500	803.00	6,041
Dec	111900	113500	111500	113325	+ 4.25	113500	811.35	254
Mr98		....	....	114725	+ 4.25	114750	99250	163

Est vol 3,214; vol Th 1,817; open int 6,458, −159.
The index: High 1,113.99; Low 1,094.32; Close 1,108.94+1.91

GSCI (CME)-$250 times nearby index

Aug	192.00	194.50	191.80	194.30	+ 2.10	199.00	181.00	21,282
Sept	191.50	193.00	191.00	193.00	+ 1.80	198.00	181.50	800

Est vol 2,853; vol Th 662; open int 22,089, +23.
The index: High 194.46; Low 191.60; Close 194.36+2.07

CAC-40 STOCK INDEX (MATIF)-FFr 200 per index pt.

Aug	3105.0	3109.0	3033.0	3053.0	− 50.0	3114.0	2726.0	29,256
Sept	3108.0	3116.0	3050.0	3061.0	− 21.0	3120.0	2535.5	23,703
Dec	3133.0	3133.0	3109.0	3086.0	− 29.0	3133.0	2295.0	968
Mr98		....	....	3112.5	− 29.0	3091.0	2166.5	9,115
June		....	....	3083.5	− 29.0	3097.0	2969.5	1,450
Sept		....	....	3102.5	− 29.0	3832.0	2204.5	4,086
Mr99		....	....	3163.5	− 29.0	3149.0	3000.0	3,300

Est vol 24,191; vol Th 41,990; open int 71,878, −11,547.

FT-SE 100 INDEX (LIFFE)-£25 per index point

Sept	4930.0	4953.0	4848.0	4879.0	− 38.0	5058.0	4132.0	73,552
Dec	....	....	....	4942.0	− 38.0	5120.0	4520.0	5,077

Est vol 9,761; vol Th 8,852; open int 78,720, +485.

DAX-30 GERMAN STOCK INDEX (DTB)
DM 100 times index

Sept	4430.0	4452.0	4265.0	4358.0	− 1.40	4498.0	2507.5	100,682
Dec	4483.5	4483.5	4333.0	4395.0	− 1.41	4529.5	3753.5	2,677
Mr98	4400.0	4400.0	4400.0	4400.0	− 3.65	4566.5	4521.0	724

Est vol 23,351; vol Th 21,890; open int 104,083, +277.
The index: High 4416.92; Low 4393.65; Close 4408.79 −.68

ALL ORDINARIES SHARE PRICE INDEX (SFE)
A$25 times index

Sept	2755.0	2755.0	2744.0	2746.0	− 10.0	2793.0	2290.0	107,795
Dec	2756.0	2760.0	2756.0	2754.0	− 10.0	2788.0	2435.0	2,602
Mr98		....	....	2767.0	− 10.0	2785.0	2535.0	1,473
June		....	....	2777.0	− 10.0	2815.0	2670.0	2,526

Est vol 7,067; vol Th 8,222; open int 114,396, −788.
The Index: High 2735.1; Low 2722.0; Close 2727.5 −7.6

U.S. DOLLAR INDEX (FINEX)-1,000 times USDX

Sept	99.50	100.48	99.54	100.38	+ .78	100.48	85.60	11,270
Dec	99.40	100.14	99.40	100.08	+ .86	100.14	94.75	549

Est vol 3,800; vol Th 848; open int 11,824, −517.
The Index: High 100.51; Low 99.54; Close 100.42 +.78

Investment Update (7/31/95)

Garish Jackets Add to Clamor Of Chicago Pits

COMMODITIES

By SUZANNE McGEE
Staff Reporter of THE WALL STREET JOURNAL

CHICAGO – For the inhabitants of Chicago's futures and options trading pits, dressing for success means throwing good taste to the wind.

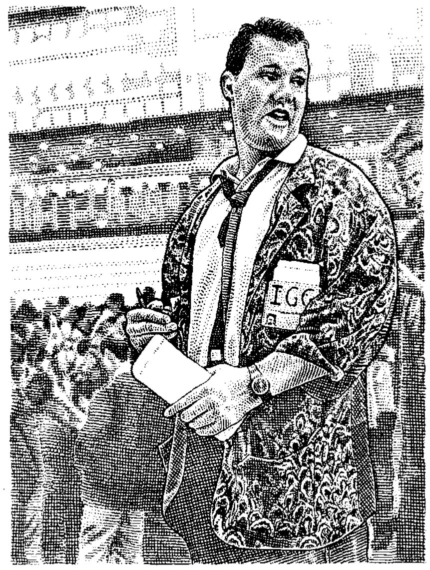
Take James Oliff, a trader in the Chicago Mercantile Exchange's newly opened Mexican peso futures pit. Daily, he dons a multicolored jacket bedecked with cacti and sombreros, in keeping, he says, with the "theme" of the product he trades.

Twisting and turning to display his gaudy garb, the veteran currency options trader explains: "I wanted a jacket that would be easy to pick out in the crowd. Runners get orders to me more quickly, and clerks find me faster when I'm trying to do trades."

It's important to have what veterans of the mayhem describe as "pit presence" to make money in the crowded and noisy trading pits of the Merc and the Chicago Board of Trade. That elusive quality, they say, involves such stratagems as finding the best spot in the pit from which to communicate with clerks and other traders, maintaining good posture and using a loud, well-projected voice and forceful hand signals to attract attention.

Increasingly, in places such as the CBOT's bond pit, where hundreds of people cram into a space only slightly larger than a tennis court, garb is being used to grab attention. Hence the insatiable demand for magenta, lime-green and silver-lame jackets, featuring designs that run the gamut from the Mighty Morphin Power Rangers to bucolic farmhouses and sunflowers.

"I'd come in buck naked if I could," says Thomas Burke, a trader in the CBOT's overpopulated bond-futures pit.



Flashy attire in the pits

"As it is, the more obnoxious the jacket, the better. The louder it is, the more I can rest my voice and let my jacket draw the attention."

Chicago's exchanges quietly tolerate the proliferation of the garish trading jackets. Dress codes ban jeans and still require members to wear shirts with collars and don ties (although some of these may be little more than strings, having been worn daily for more than a decade). The rules also say that trading jackets must have sleeves that come below the elbow and contain pockets into which the traders stuff their trading cards and other documents. But during the past decade, traders say, exchange efforts to regulate the color and design of the jackets, or gently encourage their wearers to opt for something in quiet good taste, have been dropped as an exercise in futility.

Robert Pierce, who trades corn options at the CBOT, says the old brown jackets made him look like a UPS delivery man. "When someone gave me a UPS cap on the floor one day as a joke, I decided it was time for a change of style," he says. The switch, to a comparatively tasteful multicolored geometric pattern, has the added advantage of disguising pen and pencil marks, adds his wife, Cathy.

Dawn Guera, a former clerk at the CBOT, has spun the traders' need to stand out in the crowd into a four-year-old business designing and manufacturing custom trading jackets. Traders wander into her storefront operation next door to the CBOT to choose from dozens of fabrics with designs ranging from a subdued Harvard University crest on a crimson background to a slinky leopard skin pattern or turquoise frogs cavorting on a neon-pink background.

"Everyone has their own hobbies and interests and want the jackets to reflect that," she explains, pointing to fabrics with designs of dice and cards aimed at traders willing to acknowledge their addiction to gambling in the markets. "It's like a vanity license plate."

And, at $50 a pop, traders are willing, even eager, to order multiple jackets, Ms. Guera says, especially since many believe that washing or dry cleaning a "lucky" jacket will launder out the luck in it. Some, like the CBOT's Gilbert Leistner, take a seasonal approach to jackets: in summer and fall he wears a brightly colored turquoise and aquamarine jacket decorated with tropical fish, but switches to a Southwestern theme come Thanksgiving.

"It's my version of going south for the winter," he says, adding he's contemplating donning something in gold lame for New Year's celebrations.

Ms. Guera, a former sportswear designer in New York, says traders have a long way to go before they'll pull themselves off the worst-dressed lists. To be sure, some of the early emphasis on flashiness is easing a bit, she says, and demands for fluorescent geometric patterns are giving way to a new trend favoring subtler paisley-type patterns with lapels, cuffs and pockets in a contrasting, solid color.

"I think it would be great if we could really push the fashion envelope here and remove the collar and cuffs from the jackets, or even persuade the exchanges to let traders wear vests instead," she says. "I'm looking for a way of making this whole trading process more artistic and creative."

Figure 16.2 Commodity Cash Prices

OIL PRICES

Friday, August 1, 1997.

CRUDE GRADES	Fri	Thur	Yr. Ago
OFFSHORE-d			
European "spot" or free market prices			
Arab lt.	17.07	16.77	17.57
Arab hvy.	15.32	15.02	16.27
Iran, lt.	17.92	17.70	18.27
Forties	19.52	19.20	19.59
Brent	19.12	18.82	19.37
Bonny lt.	19.57	19.31	19.72
Urals-Medit.	18.52	18.25	18.67
DOMESTIC-f			
Spot market			
W. Tex. Int Cush (1800-1975) (Sep)	20.28	20.13	21.33
W.Tx.sour, Midl (1500-1850)	18.85	18.73	19.95
La. sw. St.Ja (1750-2000)	20.53	20.35	21.38
Al. No. Slope Pacific Del*	18.06	18.22	19.34

Open-market crude oil values in Northwest Europe around 17:50 GMT in dlrs per barrel, for main loading ports in country of origin for prompt loading, except as indicated.

REFINED PRODUCTS	Fri	Thur	Yr. Ago
Fuel Oil, No. 2 NY gal.	.5606	.5546	.5911
Diesel Fuel, 0.05 S. NY harbor low sulfur	.5754	.5709	.6061
Gasoline, unlded, premium NY gal. non-oxygenated	.7482	.7459	.6687
Gasoline, unlded, premium NY gal. oxygenated	.8032	.7909	.6862
Gasoline, unlded, reg. NY gal. non-oxygenated	.6780	.6564	.6185
Gasoline, unlded, reg. NY gal. oxygenated	.7137	.7009	.6377
Propane, non-tet, Mont Belvieu, Texas, gal.	.3560	.3548	.3613
Propane, wet-tet, Mont Belvieu, Texas, gal.	.3560	.3548	.3613
Butane, normal, Mont Belvieu, Texas, gal.	.4188	.4200	.4313
RAW PRODUCTS			
Natural Gas Henry Hub, $ per mmbtu	2.230	2.225	2.200

a-Asked. b-Bid. c-Corrected. d-as of 11 a.m. est in Northwest Europe. f-As of 4 p.m. est. Refiners' posted buying prices are in parentheses. n.a.-Not available. z-Not quoted. n-Nominal. r-Revised. *Eff. 5/20/96 - No. Slope del. US Gulf no longer available. Source: Dow Jones Energy Service

CASH PRICES

Friday, August 1, 1997.
(Closing Market Quotations)

	Fri	Thur	Year Ago
GRAINS AND FEEDS			
Barley, top-quality Mpls., bu	uz	z	z
Bran, wheat middlings, KC ton	u60-63	60-63	103.00
Corn, No. 2 yel. Cent. Ill. bu	bpu2.61	2.58	4.46½
Corn Gluten Feed, Midwest, ton	68-80	65-80	110.00
Cottonseed Meal, Clksdle, Miss. ton	167.50	162.50	195.00
Hominy Feed, Cent. Ill. ton	75.00	75.00	126.00
Meat-Bonemeal, 50% pro. Ill. ton.	270-75	c270.00	240.00
Oats, No. 2 milling, Mpls., bu	uz	z	z
Sorghum, (Milo) No. 2 Gulf cwt	u482-86	480-84	7.01
Soybean Meal, Cent. Ill., rail, ton 44%	u265-71	268½-73½	239.50
Soybean Meal, Cent. Ill., rail, ton 48%	u280-86	282½-91½	249.50
Soybeans, No. 1 yel Cent.-Ill. bu	bpu7.37½	7.42	7.68
Wheat, Spring 14%-pro Mpls. bu	u4.56½	4.58	5.50¾
Wheat, No. 2 sft red, St.Lou. bu	bpu3.55	3.56	4.52½
Wheat, hard KC, bu	3.73	3.75¾	4.97
Wheat, No. 1 sft wht, del Port Ore	u4.08	4.06	4.83
FOODS			
Beef, Carcass, Equiv.Index Value, choice 1-3,550-700lbs.	u100.91	101.00	92.56
Beef, Carcass, Equiv.Index Value, select 1-3,550-700lbs.	u94.08	94.14	89.15
Broilers, Dressed "A" lb.	ux.6335	.6245	.6098
Broilers, 12-Cty Comp Wtd Av	u.6376	.6376	.6291
Butter, AA, Chgo., lb.	u1.10	1.10	1.53
Cocoa, Ivory Coast, $metric ton	1,704	1,700	1,530
Coffee, Brazilian, NY lb.	n2.11½	2.11½	1.34½
Coffee, Colombian, NY lb.	n2.21½	2.21½	1.41½
Eggs, Lge white, Chgo doz.	u.73-78	.76-81	.77½
Flour, hard winter KC cwt	10.25	10.30	12.10
Hams, 17-20 lbs, Mid-US lb fob	uz	z	z
Hogs, Iowa-S.Minn. avg. cwt	u56.50	56.25	61.00
Hogs, Omaha avg cwt	u57.50	56.50	61.50
Pork Bellies, 12-14 lbs Mid-US lb	u.91	.88-90	1.01
Pork Loins, 14-18 lbs. Mid-US lb	u1.20	1.26	1.26½
Steers, Tex.-Okla. ch avg cwt	uz	z	z
Steers, Feeder, Okl Cty, av cwt	u89.00	89.00	61.75
Sugar, cane, raw, world, lb. fob	12.49	12.55	12.57
FATS AND OILS			
Coconut Oil, crd, N. Orleans lb.	xxn.28½	.28½	.40
Corn Oil, crd wet/dry mill, Chgo.	u.25¼-26	.25¼-26	.24½
Grease, choice white, Chgo lb.	n.20¼	.20¼	.22
Lard, Chgo lb.	.24	.24	.26
Palm Oil, ref. bl. deod. N.Orl. lb.	n.25½	.25½	.23
Soybean Oil, crd, Central Ill. lb.	u2188-2208	22.15-35	.23¼
Tallow, bleachable, Chgo lb.	.20½	.20½	.22
Tallow, edible, Chgo lb.	.21	.21	.25
FIBERS AND TEXTILES			
Burlap, 10 oz 40-in NY yd	n.3225	.3225	.3550
Cotton 1 1/16 str lw-md Mphs lb	.7318	.7297	.8279
Wool, 64s, Staple, Terr. del. lb.	una	2.55	1.92½
METALS			
Aluminum ingot lb. del. Midwest	p80½-1½	.77-78	.71
Copper high gr lb., Cmx sp price	1.07	1.09	.92
Copper Scrap, No 2 wire NY lb	h.86½	.86	.75
Lead, lb.	p.46027	.45954	.49258
Mercury 76 lb. flask NY	q185-200	185-200	260.00
Steel Scrap 1 hvy mlt Chgo ton	143-44	143-44	134.00
Tin composite lb.	q3.7384	3.7103	4.1023
Zinc Special High grade lb	q.73000	.76700	.51500
MISCELLANEOUS			
Rubber, smoked sheets, NY lb.	n.53¼	.53½	.69½
Hides, hvy native steers lb., fob	u80.5-87	80.5-4.5	.98½
PRECIOUS METALS			
Gold, troy oz			
Engelhard indust bullion	325.30	327.55	387.66
Engelhard fabric prods	341.57	343.99	407.04
Handy & Harman base price	324.10	326.35	386.35
Handy & Harman fabric price	340.31	342.67	405.67
London fixing AM 325.30 PM	324.10	326.35	386.35
Krugerrand, whol	a327.00	326.00	388.00
Maple Leaf, troy oz.	a336.00	336.00	400.00
American Eagle, troy oz.	a336.00	336.00	400.00
Platinum, (Free Mkt.)	433.00	435.00	403.80
Platinum, indust (Engelhard)	437.00	433.00	404.00
Platinum, fabric prd (Engelhard)	537.00	533.00	504.00
Palladium, indust (Engelhard)	232.00	219.00	132.00
Palladium, fabrc prd (Englhard)	247.00	234.00	147.00
Silver, troy ounce			
Engelhard indust bullion	4.480	4.420	5.050
Engelhard fabric prods	4.928	4.862	5.555
Handy & Harman base price	4.465	4.420	5.025
Handy & Harman fabric price	4.912	4.862	5.528
London Fixing (in pounds)			
Spot (U.S. equiv.$4.4740)	2.7305	2.6780	3.3195
3 months	2.7715	2.7180	3.3620
6 months	2.8150	2.7605	3.3920
1 year	2.9050	2.8485	3.4920
Coins, whol $1,000 face val	a3,258	3,273	3,515

a-Asked. b-Bid. bp-Country elevator bids to producers. c-Corrected. d-Dealer market. e-Estimated. g-Main crop, ex-dock, warehouses, Eastern Seabord, north of Hatteras. h-Reuters. l-f.o.b. warehouse. k-Dealer selling prices in lots of 40,000 pounds or more, f.o.b. buyer's works. n-Nominal. p-Producer price via Platt's Metals Week. q-Platt's Metals Week. r-Rail bids. s-Thread count 78x54. u-U.S. Dept. of Agriculture. x-Less than truckloads. z-Not quoted. xx-f.o.b. tankcars.