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A Thumbnail Sketch of Derivative Securities and Their Regulation

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A THUMBNAIL SKETCH OF DERIVATIVE SECURITIES AND THEIR REGULATION

ROBERTA ROMANO*

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INTRODUCTION

Derivative securities—financial instruments whose value derives from some other, more fundamental, asset—have gone from obscurity and the arcane to the front pages of newspapers and the forefront of the legislative agenda in a very short time span. This change has occurred because a diverse set of investors, from hedge funds, corporations, and money market mutual funds to non-profit organizations, have posted large losses on derivative investments. For example, David Askin’s billion dollar hedge fund filed for bankruptcy having lost virtually all of its investors’ $600 million in equity after failing to meet margin calls on mortgage-backed securities in its portfolio.\(^1\) Procter & Gamble lost $102 million on interest rate swap contracts (roughly 15 cents per share).\(^2\) Barings PLC, a British investment bank, failed due to losses in Nikkei index futures and options positions taken by a trader in its Singapore office.\(^3\) BankAmerica had to put over $60 million into two of its Pacific Horizon money market funds to maintain their value at $1 a share in the wake of derivative losses and investor withdrawals.\(^4\) Odessa College, a small community college in Texas, lost virtually half the value of its $22 million endowment when it invested the entire endowment in mortgage-based derivatives.\(^5\) A German firm, Metallgesellschaft, A.G., lost over $1 billion on oil futures contracts used to hedge long-term supply contracts with oil customers and had to be bailed out by banks.\(^6\) And in the biggest

story on this side of the Atlantic, one of the wealthiest counties in the United States, Orange County, California, filed for bankruptcy because of over $1 billion in losses on investments in structured notes, the value of which fell sharply when interest rates rose in the fall of 1994.\(^7\)

In reaction to this spate of investor losses, congressional interest in derivatives regulation heated up. Between April and October 1994, Congress held ten hearings on derivatives.\(^8\) In addition, numerous bills were introduced in the 103d Congress proposing the expansion of the regulation of derivatives or a reorganization of the regulation of financial markets.\(^9\) A bill regulating derivatives was one of several pieces of legislation introduced by the new House Banking Commit-


tee chairman, James Leach, as the 104th Congress commenced operations in January 1995.\textsuperscript{10} In addition, in May 1994 the General Accounting Office reported to Congress that greater regulation was needed.\textsuperscript{11} There is irony in this flurry of activity, as the previous Congress in 1992 had instructed the Commodity Futures Trading Commission (CFTC) to exempt many of the same derivative financial instruments from its regulatory authority.\textsuperscript{12} Despite heightened congressional concern and reported losses, regulators have been hesitant to support sweeping new regulatory initiatives beyond narrow proposals directed primarily at enhanced disclosure.\textsuperscript{13}

The increased attention paid to derivative securities follows explosive growth in a market that barely existed a little over a decade ago. The market for financial derivatives is in the trillions of dollars (see Table 1 below), although its precise size is difficult to ascertain because there is no accurate mechanism for tracking a substantial segment of the market, off-exchange-traded contracts, as there is for exchange-traded ones. In addition, the notional value of derivative contracts such as swaps, the market measure currently collected by regulators, does not reflect the investment at risk.

Very few citizens, let alone public officials, are well informed about derivative instruments, despite the recent attention and the large size of the market. The depth of the business community’s knowledge of these instruments is also questionable. Some scholars, for example, have suggested that a significant part of Metallgesellschaft’s loss was due to its banks’ faulty understanding of the firm’s hedging strategy.\textsuperscript{14} In addition, a recent accountants’ study found that many investment management companies have inadequate risk measurement and control for the derivative products they use.\textsuperscript{15} Moreover, in the popular press and to the average citizen, “deriva-

\textsuperscript{10} H.R. 20, 104th Cong., 1st Sess. (1995) (providing a framework to improve risk-management techniques at financial institutions, including the prudential use of derivative products).


\textsuperscript{13} Keith Bradsher, Regulators See No Need for Tougher Rules on Derivatives, N.Y. Times, Jan. 6, 1995, at D12.

\textsuperscript{14} E.g., Christopher L. Culp & Steve H. Hanke, Derivative Dingbats, Int’l Econ. 12 (July/Aug. 1994).

tives,” much like speculation, has become a dirty word, hindering informed discussion.

**Table 1**

**Notional/Contract Amounts of Derivatives Held by Product Type from Year-End 1989-1992**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Derivative Instrument</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forwards\a</td>
<td>$3,034</td>
<td>$4,437</td>
<td>$6,061</td>
<td>$7,515</td>
<td>148%</td>
</tr>
<tr>
<td>Futures</td>
<td>1,259</td>
<td>1,540</td>
<td>2,254</td>
<td>3,154</td>
<td>151%</td>
</tr>
<tr>
<td>Options</td>
<td>953</td>
<td>1,305</td>
<td>1,841</td>
<td>2,263</td>
<td>187%</td>
</tr>
<tr>
<td>Swaps</td>
<td>1,952</td>
<td>2,890</td>
<td>3,872</td>
<td>4,711</td>
<td>141%</td>
</tr>
<tr>
<td>Total</td>
<td>$7,198</td>
<td>$10,172</td>
<td>$14,028</td>
<td>$17,643</td>
<td>145%</td>
</tr>
</tbody>
</table>

* The information in this table was taken from the GAO Report, *supra* note 11, at 36.
\a Includes foreign exchange, forward-rate agreements, equity and commodity forwards.

Notwithstanding the spectacular losses borne by certain investors in derivatives, these instruments serve important economic functions that cannot be overemphasized. The bulwark of derivative markets is the hedging of price risk. Successful risk management reduces the cost of doing business, thereby lowering prices to consumers. Because the demand of business hedgers is rarely met by hedgers on the other side of the market, speculators play an essential role in derivative markets. The largest derivatives losers in the recent past were, indeed, speculating.\textsuperscript{16} In addition, derivative markets serve a price-discovery function for the underlying assets. Because it is cheaper and faster to complete transactions in derivatives than in cash or spot markets (the market for the underlying assets), informed traders, whose activities change prices, trade in derivative markets.

The relatively recent origins and the technical complexity of derivative instruments—investment firms hire Ph.D.s in mathematics and physics as well as in financial economics to analyze products—make it difficult for the uninitiated to evaluate the risks, and hence the regulatory strategies, appropriate for this market sector. This increases the danger that with a political process prone to implement

\textsuperscript{16} See *supra* notes 1-7 and accompanying text. Metallgesellschaft is arguably the only exception. The regulatory response to inappropriate speculation is discussed *infra* notes 238-252 and accompanying text.
regulatory changes in crisis mode, poor policy choices will be made. For in the absence of familiarity with the issues, people tend to judge the relative frequency of an event by the accessibility of the event in their cognitive processes, that is, by the striking, particular occurrence, which may have nothing to do with the event's actual frequency. Accordingly, in policymakers' mental calculations, the recent huge losses on certain derivatives transactions experienced by particular investors will outweigh the less visible yet more pervasive benefits of derivatives. The point of this Article is to decrease the likelihood of such an outcome by making the important and technically demanding financial derivative markets and their regulatory environment more transparent to the nonprofessional.

The plan of this Article is to describe first the three fundamental derivative instruments: forward contracts, futures contracts, and options. Financial engineering has created an extensive array of instruments from more basic derivatives, and the Article then reviews three types of instruments engineered from the more elemental forms: swaps, mortgage-based derivatives, and structured notes. These more complex products have been most frequently linked in the news to investor losses and are a focus of regulatory concern. Each type of derivative is explained in depth, and historical and institutional detail concerning the instruments' markets, regulatory structure, and uses is provided.

Although derivative products are more technically challenging to understand than conventional financial instruments such as stocks and bonds, it is my belief that it is not terribly difficult for a non-specialist to develop the economic intuition necessary to appreciate what is going on in this market. More important, if current efforts at regulatory reform are to be for the better, policymakers, legislators, and the broader public must develop an understanding and appreciation of these important instruments and markets.


19. While characterized even in the business press as exotic, derivatives actually pervade everyday life. For example, a shopper who receives a rain check on a sale item that is sold out has received a derivative called an option. A homeowner with a variable-rate mortgage featuring an annual interest rate ceiling owns a specially denominated option, an interest rate cap.
I. Forward Contracts

A forward contract is an agreement between two parties to buy or sell an asset at a specified future time, referred to as the delivery date, for a specified price. For instance, a U.S. corporation may contract in June with a bank to buy pounds sterling in September, when it will be closing on a purchase of goods for its United Kingdom subsidiary. The contract fixes the exchange rate (the dollar price) that the company will pay for the pounds in three months. The party agreeing to buy the asset (the parent corporation in this example) assumes what is referred to as a "long position" in the forward contract. The party who is the asset seller (the bank in this example) assumes what is referred to as a "short position." A forward contract creates an obligation: the buyer of the contract must purchase the underlying asset from the seller of the contract at the contract's expiration date, and the seller must deliver the asset to the buyer, for the agreed-upon price. By fixing in the present the price at which the underlying asset will be acquired (sold) in the future, forward contracting reduces the risk of loss from adverse price changes and thereby reduces the cost of doing business.

No money or goods change hands at the time a forward contract is entered into; a forward contract is settled at maturity. This differs from transactions for the underlying assets, which take place in what are referred to as cash or spot markets. In such markets, goods or services purchased or sold are immediately transferred and paid for. The value of a forward contract depends on the value of the underlying asset. At the time the contract is entered into, the contract has a value of zero (neither party pays anything and neither receives anything of monetary value). Thereafter, a contract's value may increase or decrease as the market price of the underlying asset changes. If the asset increases in value after the contract is created, the value of the long position becomes positive and the value of the short position becomes negative.20 At expiration, the value is the difference between

20. Putting prices into the text's example of a forward currency contract better illustrates the symmetry of losses and gains in forward contracts. Suppose the exchange rate set in the U.S. corporation's contract for pounds is $1.5769 per pound, and that after the corporation and bank enter into the contract, the Bank of England unexpectedly raises interest rates, while U.S. rates remain unchanged. This action makes the value of the pound increase in terms of the dollar, and the spot price per pound rises, say to $1.5969. In this situation, the corporation has experienced a gain on its forward contract—it has the right to buy pounds at $1.5769 per pound—a price $.02 below what it would now have to pay to buy pounds in the spot market. The bank has correspondingly experienced a loss on the contract—it will have to sell pounds to the corporation for $1.5769—a price $.02 below what it would receive if it sold pounds in the cash market. A key characteristic of a
the contract price and the spot price of the asset, the profit (or loss) on the contract.

Forward contracts have a long history, going as far back as medieval trade fairs where “merchants often contracted for deferred delivery of goods at a price agreed to in advance.”21 The first forward contract in grain in the United States was developed in Chicago in the mid-1800s, the “to-arrive” contract, in which a farmer agreed to deliver grain at a future date for a specified price.22 The most important forward contract market today involves foreign currency (also referred to as foreign exchange). The shift to floating exchange rates with the collapse in the early 1970s of the Bretton Woods system of fixed exchange rates dramatically increased exchange rate volatility and led to expansive development of the forward currency market.23 Global daily turnover in forward transactions in foreign exchange today is estimated to exceed $400 billion.24

There are no organized exchanges or special physical facilities for forward currency trading. The market is largely an interbank market: transactions are entered into between financial institutions and their clients and traded across these entities. Informal communication channels exist between major financial institutions that make the market. Contract terms, such as the quantity of currency exchanged, are not standardized and vary with participants’ needs. There is no special federal regulatory regime for forward contracts; they are governed by state contract law.25

The risk-management feature of forward contracts is straightforward. The farmer planting grain in April is uncertain about the price he will receive for the grain when it is harvested in July. If there is an abundant harvest, July prices will be low, but if there is a poor harvest, they will be high. The farmer is therefore exposed to considerable risk. The miller, the buyer of the farmer’s grain, is also subject to substantial risk. If grain prices rise, his production costs will rise. The farmer and miller can eliminate this risk—price uncertainty—by ne-

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22. Id. at 227.
23. The Bretton Woods system pegged non-U.S. currencies to the U.S. dollar, which was convertible into gold at $35 per ounce. For a brief discussion of the system and its demise see ALAN C. SHAPIRO, MULTINATIONAL FINANCIAL MANAGEMENT 113-15 (4th ed. 1992).
25. The banks making these markets, however, face a variety of federal regulation. See infra text accompanying notes 173-185.
negotiating a contract in April that fixes the price to be paid for the grain in July. The farmer, who is short the contract, shifts the risk of selling at a lower price in July to the long, the miller in this example. The long (the miller) shifts the risk of having to buy wheat at a higher price in July to the short (the farmer).

Trading to reduce risk is called hedging, and it is a primary reason for the existence of forward markets. The hedger takes a position in the forward market that is the opposite of his position in the cash market. In this example, the farmer is long in the wheat market (he owns the grain) and consequently he is short in the forward contract, while the miller is short in the wheat market (he does not own grain) and is long in the forward contract. Hedging does not increase an investment’s returns; it simply makes a variable outcome more certain. Indeed, if asset prices are equally likely to go up or down in the future, the outcome with the hedge will be worse half of the time than had there been no hedge. For example, if July wheat prices rise above the April contract price, the farmer is worse off than had he not entered into the forward contract, for he has to sell the wheat at the lower contract price. He is only better off ex post with the forward contract than without it if the July wheat price drops, for then he is able to sell the wheat at the higher forward contract price. The hedge thus protects him from loss at the cost of reducing the maximum gain he can achieve from selling his wheat should the market move in his favor.

As there may not be an equal number of short and long hedgers, forward markets need other traders willing to bear risk—investors who seek to profit from their guesses concerning the direction of future price changes. These traders are called speculators. If such traders expect prices to rise, they take a long position in the forward market. If they expect prices to fall, they go short. Hedging shifts risks from those who do not wish to bear them, such as farmers and millers, to those investors who are willing to do so, speculators, who are not in the grain business. Nineteenth century grain speculators found that they could buy and sell the to-arrive contracts rather than the grain itself and thereby speculate on grain prices without having to concern themselves with taking delivery and storing grain.26 This development in forward contracting was the progenitor of futures contracts, and the same hedging and speculative strategies apply to futures contracts: farmers sell and millers buy futures contracts to

26. See CHANCE, supra note 21, at 227.
hedge their cash market positions, and investors buy or sell futures contracts in accordance with their views of future spot prices.

II. Futures Contracts

A. Essential Institutional Features

Futures contracts are standardized forward contracts. They are obligations to buy or sell an asset at a specified future date for a specified price, and no money changes hands until maturity. The difference is that with the standardization of contract terms, the futures contracts are readily transferrable. Futures contracts are publicly traded on exchanges, entities that provide an organized marketplace for transactions, that is, a centralized location where buyers and sellers meet. Like forward contracts, futures contracts have been in existence for a long time. The earliest known futures contracts were rice contracts sold in Japan in the 1600s.27

Futures contracts today are written on a wide variety of physical commodities and financial assets, including agricultural commodities, precious metals and natural resources, foreign currencies, and financial instruments such as fixed-income obligations and stock indices. Futures exchanges develop contracts that they believe will induce sufficient demand to be successfully marketed. Two key features of successful futures contracts are (1) volatility in the price of the underlying asset, which is the source of user demand for a futures contract, the desire to reduce price risk, and (2) homogeneous units of the asset, which is a feature that eliminates disputes over value and guarantees abundant supply so that market competition sets prices. Because a primary use of futures contracts is to reduce price risk, turnover in contracts offered indicates change in the volatility of asset prices. For instance, contracts on agricultural products, such as ketchup and butter, whose prices became predictable as production and shipping technology improved, are no longer traded.

The largest futures exchanges are the Chicago Board of Trade (CBOT) and the Chicago Mercantile Exchange (Merc). The CBOT’s 1993 market share of U.S. futures exchanges’ contract-trading volume was approximately two-fifths, and the Merc’s was approximately one-third.28 The total number of contracts outstanding is referred to as the “open interest”; as each contract has a long and a short side, the

28. CHANCE, supra note 21, at 236-37.
two sides together count as one contract. Trading on futures ex-
changes takes place in ring-shaped pits in a process known as “open
outcry,” by which traders use hand signals and oral communications
to place bids and make offers simultaneously. This pure auction
mode of trading differs from the mechanisms for trading securities.

Stock exchanges typically use a system of specialists — individuals who
have exclusive rights to make the market in specific stocks listed on
the exchange — and there is a multiple dealer market-maker system
for stocks traded over-the-counter (unlisted stocks). For the most ac-
tively traded unlisted stocks, dealers place their quotes on the Na-
tional Association of Securities Dealers’ Automatic Quotation System
(NASDAQ), an electronic quotation system available to market
participants.

Futures exchanges set the standardized terms of their contracts,
which involve, among other items, contract size, quotation unit, mini-
imum price fluctuation, delivery terms and procedures, and contract
duration. For example, the CBOT contract for U.S. Treasury bonds
specifies, among others, the following terms: delivery months of
March, June, September, and December; a contract size of $100,000; a
minimum price change of $31.25; the last trading day as the
business day prior to the last seven days of the contract month; the
first delivery date as the first business day of the contract month; a
deliverable bond as a bond with a maturity over fifteen years that is
not callable within fifteen years.29 There is also a specified conversion
formula that adjusts the settlement price for the particular bond
delivered.

Most contracts have price limits, which place a limit on the maxi-
mum daily price change that can occur. When a contract moves be-

29. Id. at 231-32.
in force. Some contract markets, therefore, prescribe expansion in the price limit when prices hit the limit for an extended period (referred to as variable limits). In addition, in some contract markets, daily price limits apply only to certain times of day (such as the contract open). In others, limits are eliminated in the contract delivery month, to ensure convergence between futures and cash market prices.

The CBOT introduced the first futures contract in financial assets in 1975, an interest rate futures contract on Government National Mortgage Association (Ginnie Mae) pass-through certificates. Although financial futures are recent products compared to most physical commodity futures contracts, they dominate futures markets today. Over half of the total volume of contracts traded on U.S. futures exchanges is in financial futures. The most important category of contracts, by trading volume and value, is interest rate futures. These contracts have grown exponentially with the corresponding dramatic increase in the volatility of interest rates since the Federal Reserve’s 1979 shift in focus from the level of interest rates to growth of the money supply. For example, from 1979 to 1985, the standard deviation of monthly returns more than doubled. As a result of this new business environment, financial institutions, corporations, and other investors have increasingly sought to reduce their interest rate exposure. Additionally, foreign currency futures trading has risen steadily, alongside the much larger forward market, following the increase in exchange rate volatility after the Bretton Woods fixed-exchange rate system was abandoned in the early 1970s. In 1991 the total value of interest rate and currency futures contracts worldwide was approximately $2.2 trillion.

A principal consequence of the difference between futures and forwards, contract standardization, is greater ease in the trading of contracts. Because contract terms are standardized, traders can close out a position by engaging in an opposing transaction (the long sells a contract and the short buys a contract). They do not have to take or make physical delivery of the underlying asset, as they would if con-

30. Id. at 227.
31. See, e.g., id. at 236 fig. 7.1; id. at 261 tbl. 7.6.
32. Stanley B. Block & Timothy J. Gallagher, The Use of Interest Rate Futures and Options by Corporate Financial Managers, 15 Fin. Mgmt. 73, 74 (Autumn 1986).
33. Id. The range in short-term interest rates was 1200 basis points during this period.
34. See Shapiro, supra note 23, at 118.
35. Group of 30, supra note 24, at 32 n.5. The General Accounting Office’s estimate of the value of such contracts for 1992 is over $3 trillion. GAO REPORT, supra note 11, at 187.
tract terms were idiosyncratic, rendering it difficult or expensive to
find someone willing to assume their side of the contract. This fea­
ture of futures contracts increases the willingness of investors outside
of the industry of the underlying asset to assume the price risk that
hedgers are seeking to unload. The outsider does not have to deal
with the details of trading the actual commodity, as he can close out
his position by offset. The shift from forward to futures contracts low­
ers trading costs and expands market participation, thereby reducing
the cost of hedging.

Just as with a forward contract, changes in the price of the under­
lying asset produce the opposite effect on the value of the two sides to
a futures contract. What the buyer, or long, gains if the asset's value at
the delivery date is above the futures price, the seller, or short, loses.
The opposite holds for decreases in asset value. In contrast to forward
markets, however, buyers of futures contracts, in the vast majority of
transactions, do not take actual possession of the good, and sellers do
not deliver it. Instead, each closes out his position prior to the deliv­
ery date by purchasing (or selling) the other side of the contract.
Those who bought or sold the contract to hedge a spot purchase or
sale then purchase or sell the underlying asset in the spot market.
The gain or loss on the futures contract offsets the corresponding loss
or gain on the spot market transaction. For asset buyers, this strategy
avoids the possibility of receiving a product of undesired quality, be­
cause, in order to minimize the possibility of market manipulation,
contracts permit the delivery of a variety of grades of the commodity,
with corresponding price adjustments, and the short controls the
delivery.36

It must be noted that even though cash settlement (by contract
reversal) is the most typical method of settlement in futures markets,
the physical delivery option is critical; it establishes the pricing rela­
tion between futures and spot markets. Because the underlying asset
can be delivered at the expiration of the futures contract, the prices in
both markets must be equal on the contract's expiration date. Other­
wise, traders can engage in arbitrage and earn risk-free profits.37 For
example, if at expiration the futures price was higher than the spot
price, a trader could sell the contract, buy the underlying asset in the

36. See infra text accompanying notes 55, 74-87.
37. Arbitrage is the buying of something at one price and the simultaneous selling of it
or something equivalent at a higher price. In competitive markets, investors flock to ex­
plot an arbitrage opportunity, and their demand for the cheaper item and concomitant
supply of the higher priced item eliminates the price differential. Accordingly, the ability
to earn arbitrage profits in such markets is, at best, small and fleeting.

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spot market, and deliver the asset on the contract. This would lock in a sure profit equal to the difference in contract and spot market prices. This arbitrage relation continues to define the futures price prior to expiration, adjusted for factors bearing differentially on the futures and asset holders. The cost of storing the commodity (which only the asset holder bears) and the opportunity cost of capital or the interest foregone (a futures holder earns interest because he does not pay for the asset until the contract matures) raise the futures price compared to the spot price; they are referred to as the "cost of carry" (the cost of carrying the asset in one's portfolio over the term of the futures contract).

Table 2 (below) provides a simple numerical example of the arbitrage principle linking futures and spot prices. Because the futures price is higher than that predicted by the pricing relation, an investor can make a sure profit, with no out-of-pocket cash investment, by borrowing to buy the asset and selling the futures contract. Upon the expiration of the contract, the investor delivers the asset, pays back the loan, and receives the futures price. The result is a fixed profit regardless of the asset's price at the contract's expiration and it amounts to the mispricing of the futures contract. Because the profit is fixed from the outset when the investor commences the strategy, the strategy is termed risk-free arbitrage. As investors rush to buy the underpriced asset and sell the overpriced futures contract, the imbalance of supply and demand pushes the futures price down and the asset price up, realigning prices in accordance with the predicted relation and eliminating the opportunity for arbitrage profits.

As a consequence of arbitrage, futures markets have an important price-discovery function for the underlying spot markets. Individuals with information that the future direction of spot prices will be different from what current prices suggest will trade in the futures markets. Their activity conveys information about prices and moves spot market prices in the correct direction. Individuals with new information trade in futures rather than cash markets because it is cheaper and more effective to trade in futures markets. Transaction costs are lower, and trades can be executed more quickly in futures markets. This permits the exploitation of smaller price differentials. In addition, futures markets can absorb larger transactions without a price impact because of their greater liquidity.38 New information about asset value is, therefore, typically incorporated first in futures prices,

and this is why futures markets are referred to as price-discovery markets.

**Table 2**

**Arbitrage Relation of Futures and Spot Prices**

Let:

- \( S \) = spot price today = $40
- \( r \) = interest rate = 1% per month
- \( T \) = expiration of futures contract = 6 months
- \( F \) = futures price today
- \( S(T) \) = spot price at time \( T \)

By standard futures pricing for an asset that pays no dividends over \( T \), such as gold:

\[
F = S(1 + r)^T = 40 \times (1.01)^6 = $42.46.
\]

Suppose instead that \( F = $43 \). Then there is a riskless arbitrage strategy of borrowing $40 for six months at the interest rate \( r \), buying the asset with the loan proceeds, and selling the futures contract. Consider the cash flows of this portfolio:

<table>
<thead>
<tr>
<th>Action</th>
<th>Cash Flow Today</th>
<th>Cash Flow at Time ( T )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borrow $40</td>
<td>+40</td>
<td>-40 \times (1.06)^6 = -42.46</td>
</tr>
<tr>
<td>Buy asset</td>
<td>-40</td>
<td>( S(T) )</td>
</tr>
<tr>
<td>Sell futures</td>
<td>0</td>
<td>( F - S(T) = 43 - S(T) )</td>
</tr>
<tr>
<td>Portfolio Value</td>
<td>0</td>
<td>$0.54</td>
</tr>
</tbody>
</table>

With no cash investment, we have made a guaranteed profit of $0.54, regardless of the spot price at time \( T \). The profit equals the mispricing of the futures contract, $43 - 42.46. This is a riskless profit opportunity, referred to as cash-and-carry arbitrage (we buy the cash good and carry it to the expiration of the futures contract).

If, for example, producers or storers of wheat observe that wheat futures prices indicate wheat spot prices will increase relative to their operating costs, they will produce and store more wheat, and consequently improve the allocation for future consumption.\(^{39}\) Of course, if the futures traders are misinformed (or manipulating the market) such that the price in the future should not be higher than that predicted by current costs, then the price-discovery function of the futures market will have misfired and resources will be misallocated, with more grain produced and stored than needed. Nevertheless, where markets are thick a misinformation scenario is improbable.

The ease of closing out a position in a futures contract is one of the principal benefits of transacting on an exchange. The benefit to speculators has already been noted, but hedgers who use the underlying product also benefit. In order to reduce the possibility that a

\(^{39}\) For a detailed discussion of the price-discovery function of futures markets using this example, see Hans R. Stoll & Robert E. Whaley, Futures and Options 12-13 (1993).
trader could manipulate futures prices by cornering the market for the underlying commodity, futures contracts specify a range in the quality of deliverable goods under the contract, with settlement prices adjusted accordingly. Contracts also fix delivery locations. The shorts who must make a delivery on a futures contract get to choose the quality of the goods and the delivery location. Therefore, longs prefer to use spot market transactions to make the purchases they have hedged through their futures positions. Buying in the spot market guarantees that they will receive the specific product quality (or delivery location) they desire. Hedgers therefore will close their futures position by offset just as speculators do. The net profit from the hedge is the same as the gain the longs would have had if they had taken delivery on the contract.

In some contracts, such as stock index futures and Eurodollar futures, there is only cash settlement, and no physical delivery is permitted. At expiration, the value of the index or Eurodollar interest rate is compared to the futures contract price and the gain or loss is paid. In Eurodollar contracts, delivery is impossible because there is no deliverable "asset" (the contract is on an interest rate). Although for stock index futures contracts, one could physically deliver an index by delivering shares of all the stocks composing the index, physical delivery would be cumbersome and expensive.40

B. The Futures Clearinghouse System

An important institutional difference between forward and futures markets, which enhances market liquidity and is related to futures contracts' standardization, is the clearinghouse system. Each futures exchange establishes a clearinghouse that is interposed between the parties to a futures contract—the clearinghouse becomes the seller to the purchaser of the futures contract and the purchaser to the seller of the contract. The clearinghouse guarantees perform-

40. Physical delivery on stock index futures contracts is also prohibited by statute, as part of the SEC-CFTC jurisdictional accord. See infra note 117 and accompanying text. The source for the prohibition was the SEC's concern that physical delivery could facilitate manipulation of the stock market. This was a variant of its concern that futures trading would adversely affect stock prices, a consideration that drove the SEC to oppose equity futures contracts in the first place, and led to its jurisdictional battle with the CFTC and the eventual accord. A recent financial product innovation, Standard & Poor's Depository Receipts (SPDRs), a stock index basket traded on the American Stock Exchange, would make physical delivery on an index futures contract feasible. These are shares of a unit investment trust that holds the stocks in the S&P index. Trading SPDRs is intended to be equivalent to trading the index. See Joseph S. Rizzello, The Development and Evolution of Derivative Products, in The Handbook of Derivatives and Synthetics 1, 15 (Robert A. Klein & Jess Lederman eds., 1994).
ance of the futures contract. Its net position is always zero, because it enters into both sides of each contract entered into by investors.

The clearinghouse is most typically an independent corporation, whose stockholders are the member clearing firms and are also members of the supporting exchange, although not all exchange members are members of the clearinghouse. All trades on an exchange must be cleared through a clearinghouse member. The clearing firms are responsible for clearinghouse debts; that is, they provide the funds behind the clearinghouse's guarantee. These firms must maintain margin accounts with the clearinghouse, contribute separately to a reserve fund to cover clearinghouse obligations, and meet minimum financial standards. While the clearinghouse monitors its members' financial positions, the members keep track of positions of their customers, the actual traders.

The result of this clearinghouse arrangement is that no investor can be harmed by the failure of its contracting party to fulfill contract terms financially upon the delivery date; the clearinghouse pays the difference. An investor's failure to perform thus hurts the clearinghouse and not another investor. In a forward contract, there is no such substitution of a clearinghouse for the contracting parties. Thus, forward market participants are subject to far greater risk of nonperformance than are futures market participants. This feature has institutional ramifications. There is both an active forward and futures market in foreign currencies, but the traders in the foreign currency forward market are more creditworthy than traders in foreign currency futures: the forward market is comprised almost exclusively of institutional, rather than individual, traders.

To protect themselves against contract defaults, clearinghouses use a system of margin accounts and daily settlement. The clearinghouses set contract margin requirements for their members and use members' margin accounts to cover the obligations of a member's defaulting customer. If the member's assets are insufficient, the clearinghouse's reserve fund, supplemented or replenished by special assessments on all of its members, is used to cover the obligation. Accordingly, clearing firms impose margin requirements that are at least as stringent as the clearinghouse's requirements on their customers,

41. The clearinghouse does not stand behind physical delivery contract performance. Its role with respect to physical delivery is simply to handle the notification of investors' intentions to deliver or take delivery. The most common method used by clearinghouses to match a delivery request is to assign it to the member with the oldest opposite position in the contract. The member uses a prearranged formula, disclosed to its customers in advance, such as first-in-first-out, to allocate a delivery request.
the actual buyers and sellers of the contracts, to cover their obligations to the clearinghouse. If a trader's broker is not a clearinghouse member, there is an additional layer of accounts: the trader has a margin account with his broker, who in turn has a margin account with the clearing firm.

When two traders enter into a futures transaction, a margin account is created for each. The initial margin deposit (which is the same for buyer and seller) typically ranges between one and twenty percent of the value of the contract's underlying asset. The customer may use Treasury securities to post margin, and the broker must pay the securities' interest back to the customer. For such customers, there is no opportunity cost to the futures margin account. Brokers are not, however, required to pay interest on cash deposited in margin accounts, even if the brokers earn interest on that cash. Margin accounts are adjusted daily in response to changes in the value of positions, a process that is called "marking to market." If a customer's position experiences a gain, his account balance is increased and he may withdraw the profit from the account. If he experiences a loss, his account balance is reduced. The effect of this daily revaluation of margin accounts based on the daily settlement price of the futures contract is to close out the contract daily and write a new one that is priced at the market and thus has a zero value. The marking-to-market practice is unique to futures markets.

If a margin account falls below a critical value called the maintenance margin—which is the minimum amount per contract that a customer must keep on deposit at all times and is typically set at seventy-five percent of the initial margin—the account's owner must transfer new funds into his account to bring the balance back up to the initial margin level. These additional deposited funds are called variation margin. If the customer fails to add the required amount, the broker liquidates the account or closes out enough of the position to meet the margin call. The same daily settlement system is applied to clearinghouse member firms' margin accounts. Some clearinghouses permit members to net across their customers' positions to determine the margin amount, which substantially reduces the funds the member must hold on margin compared to a gross account system.

The daily settlement system enhances market integrity (and the clearinghouse's guarantee) because losses are covered incrementally over time rather than all at the end of the contract, when an investor could have accumulated a substantial loss that he cannot cover. Because positions will be closed out before huge losses can accumulate, marking to market limits the risk of nonperformance. There are no
margin accounts and daily settlement in forward markets and, not surprisingly, forward market participants' creditworthiness is far greater than those trading in comparable products on futures exchanges.

Margin amounts are related to the volatility of price changes in underlying assets: contracts on more volatile assets have higher margins. The logic of the margin formula is that the initial margin amount should cover all likely daily changes in the value of a contract, thereby ensuring that, under daily marking to market, all of a customer's probable losses will be covered. This is intended to protect the broker against liability to the clearinghouse, and the clearinghouse from liability to other investors arising out of a customer default. Market participants contend that this use of margin—good faith money put up to protect against default—differs importantly from the use of margins in securities transactions. The margin account in a security transaction is a down payment for a loan from the broker for the purchase of a security. Therefore, stock investors do not put up Treasury securities and receive interest on margin accounts; instead, they often pay interest to their brokers.

Given this difference in function, it is not surprising that the margin requirements for stocks and stock index futures are dramatically different (fifty percent versus ten to fifteen percent respectively). Securities regulators see things differently and argue that margins should be mandated by the government at the same level for both stocks and stock index futures. But their position makes little sense. Even if one were skeptical of participants' claims that the margin function differs, because in both cases margin accounts guarantee performance (delivery on a futures contract or repayment of a loan to purchase stock), it is clear that the stock index futures margin should be significantly less than the stocks' margin because an index is much less volatile than an individual stock. For example, the historical standard deviation of the returns on the S&P 500 (Standard & Poor's com-

posite index) is 20.8% whereas the average historical standard deviation of individual stocks is close to 50%.43

As a result of the daily marking to market of futures contracts, the contract's delivery date does not govern the realization of profits or losses—they are realized over the life of the contract. Accordingly, there is a cash flow timing difference for futures contracts compared to forward contracts. While the overall gain or loss on equivalent forward and futures contracts is the same, holders of futures contracts recognize gains and losses immediately because of the daily settlement process and they are thereby affected by interest rate movements as gains are reinvested or losses financed. Empirical studies indicate, however, that the difference in futures and forward prices due to this differential timing factor is trivial.44

The clearinghouse system makes it easier for futures traders to close their positions than it is for parties to forward contracts. To undo a position, a futures investor instructs his broker to enter into a transaction on the other side of the contract, reversing the original position. For example, if the investor is long, he instructs his broker to sell a contract. Upon the reversing transaction, the investor nets out to zero, since he holds both a long and a short position in the same contract, which cancel each other out. This is a convenient method of closing out a position, because it involves only bookkeeping (closing out the account with the clearinghouse), rather than negotiating with the party to the original contract to terminate or assign the contract, as must be done in the forward market.

The function of a clearinghouse in futures markets differs from that of clearing associations in securities markets. Although in both markets clearing institutions perform a banking function by facilitating the transfer of funds between contracting parties and their agents, clearing associations in securities markets do not become parties to transactions, act as guarantors of contracts, or facilitate settlement by delivery. The different function of futures clearinghouses is necessitated by the difference in the market transactions involved. The fulfillment of futures contracts requires a trader’s future performance, which cannot be guaranteed by the trader as readily as the immediate performance that occurs in a stock purchase or sale (stock transactions must be finalized and cleared in three days). Stock traders bear the risk of counterparty default, given the lack of a clearinghouse

43. Stephen A. Ross et al., Corporate Finance 262 (3d ed. 1993).
44. For a summary of these studies, see John C. Hull, Options, Futures, and Other Derivative Securities 57 (2d ed. 1993).
guarantee, but that risk is small because it is limited to a few business days.

To date, the clearinghouse system has been successful in its guarantee function. There has been no futures clearinghouse default. Nevertheless, because individual traders trade through brokers, they are actually subject to the credit risk of their broker. Traders cannot be harmed by the other side's failure to perform on a futures contract because the clearinghouse covers such defaults. They could, however, lose the value in their margin accounts if their broker goes bankrupt (the clearinghouse does not stand behind the broker). The customer account segregation rules are supposed to mitigate this possibility, but they are not always successful.

C. Regulatory Regime

1. Creation of the CFTC.—The exchange-traded property of futures contracts is the key divide for regulatory purposes between types of derivative securities. An independent federal agency, the Commodity Futures Trading Commission (CFTC), regulates futures contracts, which must be sold on exchanges. It does not regulate non-

45. 7 U.S.C. § 6d(2) (1994); see also infra notes 72-73 and accompanying text.
46. The most serious incident involving a futures exchange clearinghouse illustrates the risks that brokers' financial difficulties pose to their customers. In March 1985 three customers of Volume Investors, a clearing member of the Commodity Exchange (COMEX), failed to meet a $26 million margin call on short positions in gold options. See Michael A. Hiltzik, Comex Still Unraveling a Big Debacle; One Group's Default Proves Vulnerability of Unwary Traders, L.A. TIMES, May 20, 1985, pt. 4, at 1. As Hiltzik recounts, because Volume Investors had only approximately $4 million in capital, it was unable to meet the margin call and it failed. All of its customer accounts were frozen while it was suspended from trading and put into receivership. After seizing the margin deposits along with Volume's other assets, the COMEX Clearing Association (CCA) liquidated all of the customer accounts to cover Volume's default. This not only infuriated Volume's customers, as the liquidation was done at fire-sale prices, but shocked futures markets generally, as traders thought they were protected by the segregation rules and would not be harmed by other customers' defaults. Traders' expectations concerning the safety of individual accounts were informed by the practice that had been followed by other exchanges upon broker insolvencies, which avoided such losses.

Volume's nondefaulting customers eventually did recover the account balance that remained after their holdings had been liquidated. Laurie Cohen, COMEX to Help Pay Firm's Debts, Cen. Tues., Dec. 10, 1985, (Business), at 3. Although the CCA was not technically responsible for the funds, it agreed to replace them because of reputational concerns and apparently considerable industry pressure. Id. The amounts paid, however, did not cover losses in account value experienced upon CCA's liquidation of the accounts. Two years later, in response to Volume Investors' failure, the CFTC changed financial early-warning system rules to require clearing members to notify the exchange, as well as the agency, immediately if the amount owed in an undermargined customer account is greater than the firm's capital. CFTC Shores Up Financial Rules Applicable to FCMS, 19 Sec. Reg. & L. Rep. (BNA) No. 31, at 1140 (July 31, 1987).
exchange-traded contracts, that is, forward contracts. Federal regula-
tion of futures began in 1922, and until 1974, the futures regulator 
was an entity within the Department of Agriculture, reflecting the 
futures markets' origins in contracts on agricultural commodities.47

The move to form an independent agency in 1974 ostensibly de-

erived from the desire to expand regulatory coverage to then-unregu-

lated futures trading, which included several contracts on nonagricultural products, such as silver and foreign currency futures, 
as well as internationally grown agricultural products like coffee and 
sugar. Proponents of an independent agency maintained that regula-
tion of the new nonagricultural contracts would require expertise be-
yond the Agriculture Department's capacity. The fact that the CBOT 
was contemplating marketing futures on Government National Mort-
gage Association certificates was cited as further reason to create an 
independent agency.48

But the concern over expertise appears to have been only a pe-

ripheral reason for an independent agency because no one, not even 
independent agency proponents, foresaw the dramatic shift in the 
market away from a predominance of agricultural products that oc-
curred in the following years. The principal criticism of the regula-
tory structure that led to the formation of the CFTC was the inherent 
conflict of interest in assigning market regulation to the Department 
of Agriculture, an organization that had a duty under other legislation 
to protect farmers' income. It was argued that the Department of Ag-
riculture could not be trusted to be neutral regarding futures prices. 
At the time, there had been a steep increase in food prices and some 
newspaper reporters alleged that speculators' trading was the cause,

47. The original entity was the Grain Futures Administration, established in 1922 by 
the Secretary of Agriculture to implement the initial federal legislation regulating futures, 
the Grain Futures Act, ch. 369, 42 Stat. 998 (1922). This bureau became a separate entity 
with the enactment of the Commodity Exchange Act of 1936, ch. 545, 49 Stat. 1491, called 
the Commodities Exchange Commission, which consisted of the Secretary of Agriculture, 
the Secretary of Commerce, and the Attorney General, with the Secretary of Agriculture 
exercising day-to-day regulatory authority. The Agriculture Secretary immediately created 
an agency within his department, the Commodity Exchange Administration, later renamed 
the Commodity Exchange Authority, to carry out his functions. This entity replaced the 
Grain Futures Administration and regulated futures until the establishment of the CFTC in 
(codified as amended at 7 U.S.C. §§ 2-22 (1994)).

48. See HOUSE COMM. ON AGRICULTURE, COMMODITY FUTURES TRADING COMMISSION ACT 
Senate hearings on the legislation, Senator McGovern raised all of the reasons discussed in 
the text for the establishment of an independent agency. Commodity Futures Trading Commission Act: Hearings Before the Senate Comm. on Agriculture and Forestry, 93d Cong., 2d Sess. 
although the Agriculture Department testified that such claims were incorrect.\textsuperscript{49} A more plausible, albeit unstated, reason for the proposal was the Democratic Congress's desire for greater control over regulatory policy, given its dissatisfaction with the Nixon Administration's agricultural policy, which sought to reduce farm subsidy programs, as well as its general deregulatory philosophy.

2. \textit{CFTC Jurisdiction.}—The Commodity Exchange Act (CEA) furnishes the CFTC with exclusive jurisdiction over futures contracts on all commodities.\textsuperscript{50} It defines a commodity, in addition to a list of specifically enumerated agricultural products, as "all other goods and articles . . . and all services, rights, and interests in which contracts for future delivery are presently or in the future dealt in."\textsuperscript{51} The agency's regulatory authority derives from the statute's prohibition of futures trading unless conducted on an agency-authorized contract market or exchange (called a "board of trade").\textsuperscript{52} Futures contracts must therefore be approved by the CFTC before they can be traded, and exchanges proposing a contract must comply with CFTC regulations to be authorized as boards of trade. Approvals for trading are done on a contract-by-contract basis, as each generic contract constitutes a separate contract market.

For a contract to be designated a contract market, the CFTC must find that the contract is "not . . . contrary to the public interest,"\textsuperscript{53} and the offering exchange must demonstrate that it provides a mechanism for prevention of manipulation of contract prices.\textsuperscript{54} Although one can engage in an esoteric discussion over the meaning of the statutory standard for approval, given the confusing legislative history involving the removal of language in the original bill requiring an economic purpose test,\textsuperscript{55} the bottom line is that a contract that has no commercial use (that is, no risk-management or price-discovery function) will not be profitable for an exchange to trade. Speculators tend not to provide the constant and sufficient base of market demand that business users (hedgers) do. Basil Yamey has succinctly summarized the

\begin{itemize}
\item \textsuperscript{49} Commodity Futures Trading Commission Act of 1974: Hearings Before the House Comm. on Agriculture, 93d Cong., 2d Sess. 27 (1974) (statement of Clayton Yeutter, Assistant Secretary for Marketing and Consumer Services, U.S. Dep't of Agriculture).
\item \textsuperscript{50} 7 U.S.C. §§ 2-2a (1994).
\item \textsuperscript{51} 7 U.S.C. § 1a.
\item \textsuperscript{52} 7 U.S.C. § 6.
\item \textsuperscript{53} 7 U.S.C. § 7(7).
\item \textsuperscript{54} 7 U.S.C. §§ 2a(ii)(II), 7(4).
\item \textsuperscript{55} See 1 Philip M. Johnson & Thomas L. Hazen, Commodities Regulation § 2.07, at 263-64 (2d ed. 1989).
\end{itemize}
empirical evidence supporting this claim as follows: (1) the volume of trading is positively related to the volume of hedging; (2) the decline of a commodity market is accompanied by the “decline and demise” of the futures market (e.g., frozen eggs); (3) the decline in short-hedging in “backwardation” markets (markets where the futures price is less than the spot price) because of its high cost given the price relation, is paralleled by a decline in nonhedging trading and the thinning of formerly active trading markets; (4) futures contracts beyond eighteen to twenty-four months are rare and the contracts with the longest maturity (which are contracts with limited hedging interest because users of the commodity “are rarely likely to consider transactions in actuals that commit them more than a year ahead”) are very thinly traded. 56

A fundamental issue created by this regulatory set-up involves the legal definition of a futures contract, for it provides the linchpin for CFTC jurisdiction. Although futures and forward contracts are virtually indistinguishable from an economic perspective, forward contracts are excluded from the CFTC’s regulation, and thus are permitted to trade in unregulated forums. As a result, a significant amount of litigation over whether products are futures contracts arises as parties seek either to avoid or come under the CFTC’s regulatory regime. Two different CEA provisions are the source of the exclusion and are at the heart of the litigation.

Forward contracts were exempted from federal regulation when futures first came under federal control in 1922, in a provision referred to as the “deferred delivery” or forward contract exception, in order to prevent farmers’ cash-deferred transactions (forward crop sales) from being subject to regulation. 57 There are two typical


57. Grain Futures Act, ch. 369, 42 Stat. 998 (1922) (codified at 7 U.S.C. § 1a(11) (1994)). The first federal statute regulating futures was enacted in the wake of declining crop prices in the severe agricultural depression during 1920 and 1921 after European agricultural production recommenced with the end of World War I. Futures markets reopened as government price controls were lifted with the end of the war and the politically organized farmers held the “speculators” on futures markets responsible for the post-war decline in agricultural prices. See, e.g., Future Trading: Hearings Before House Comm. on Agriculture, 66th Cong., 3d Sess. 17 (1921) [hereinafter Hearings] (statement of C.H. Hyde, Farmers Union of Oklahoma). The deferred delivery exception protected farmers from having to contract on exchanges when they agreed to sell their crops for future delivery. Although the exchanges opposed regulation, they ultimately accepted the registration system because the exchange trading requirement actually protected their business by prohibiting off-exchange trading occurring in bucket shops. Bucket shops were in the business of taking bets on commodity prices. They did not place and execute contract orders for the underlying assets as did the exchanges. Instead, using the exchanges’ price
sources of litigation over whether a particular product is a futures or a forward contract. Either the CFTC seeks to enforce its authority and prevent a contract from trading by asserting that off-exchange-traded instruments are illegal futures contracts (not duly registered and traded on a recognized exchange), or private parties with contract losses attempt to avoid payment by contending that the contract is unenforceable as an illegal futures contract.

Because there are no statutory definitions of either a futures or forward contract, the institutional features differentiating forward and futures markets (such as marking to market and cash settlement) have become the operational legal distinctions employed in determining the applicable regulatory regime. The four classic elements of a futures contract identified by the CFTC, and followed by courts, are (1) a standardized contract, (2) offered to the general public, (3) secured by earnest money or margin, and (4) entered into primarily for the purpose of shifting price risk and not for transferring ownership of actual commodities (that is, the contract is settled by offset rather than by taking physical delivery of the underlying asset). Most cases turn on the fourth factor, whether physical delivery of the goods ordinarily occurs under the contracts. But the second factor, whether the traders are members of the general public, also can be decisive.

For example, in Commodity Futures Trading Commission v. Co Petro Marketing Group, the court upheld the CFTC's finding that a gasoline broker's "agency agreements" with customers for the purchase and sale of motor vehicle fuel were illegal (non-exchange-traded) futures contracts by applying the CFTC's four-factor test. The contracts were marketed to members of the general public, who never took delivery. While the terms were not standardized, the broker always offset the contracts for its customers, a feature that the court considered the functional equivalent of standardization, for it viewed the essential

quotations, they simply paid off customers whose bets won and took money from those whose bets lost. When winning bets were numerous, the bucket shops would disappear or file for bankruptcy. They were the object of state regulatory efforts, with the exchanges often at the forefront, to prohibit gambling. For an interesting discussion of the exchanges' efforts to distinguish legitimate commercial speculation from gambling, by redirecting press attacks on "gambling" speculators on exchanges into attacks on "counterfeit" speculators in bucket shops, see Ann Fabian, Card Sharks, Dream Books and Bucket Shops 188-200 (1990).

59. 680 F.2d 573 (9th Cir. 1982).
60. Id. at 581.
function of standardized contracting as the facilitation of contract termination by offset.\textsuperscript{61}

In \textit{Transnor (Bermuda) Ltd. v. BP North America Petroleum}, a decline in the market value of oil led the plaintiff to refuse to take delivery on a contract for the future purchase of oil and to sue the defendant for violating various provisions of the CEA and other statutes.\textsuperscript{62} The defendant maintained that the CEA did not apply because the contracts were forward contracts. The court held that the off-exchange contracts, which called for fifteen-day delivery of Brent crude oil (North Sea oil), were futures contracts, and hence the CEA applied.\textsuperscript{63} The court's decision relied upon the fact that most of the trades were for hedging purposes and not for actual delivery of the oil. Although there was no contractual "right" for a party to offset its contract and avoid delivery, the market practice was for the parties to agree to cash settlement.

The Brent oil contract market was an institutional market used largely by oil producers. The court's holding that the contracts were futures severely disrupted the market, creating undesirable uncertainty for the oil companies using these contracts, for it meant they would have to comply with CFTC rules and regulations that did not fit with their market. The CFTC responded by overturning the court's decision through the issuance of a statutory interpretation that declared the Brent oil contracts forward and not futures contracts.\textsuperscript{64} The agency emphasized that the contracts were privately negotiated among commercial enterprises in the oil business and included the risk that a purchaser would be required to take delivery (that is, a party did not have to agree to offset its contract).\textsuperscript{65}

The CFTC's seemingly contradictory positions in these two representative forward contract exemption cases are easily reconciled. The CFTC is most concerned with exerting authority over contracts that are marketed to unsophisticated members of the public—investors who are thought to be in greatest need of the protection offered by the CEA, such as the clientele of Co Petro—as opposed to markets

\textsuperscript{61} Id. at 576.


\textsuperscript{63} Id. at 1493.


composed of commercial and institutional traders, such as the Brent oil market. This agency attitude toward institutional markets may, however, change. In the wake of institutional investors’ substantial losses in the unregulated off-exchange derivative market, the then CFTC chairman indicated that in her judgment even sophisticated institutional investors needed to be protected. 66

The 1974 legislation creating the CFTC included a second exemptive provision, the so-called Treasury amendment, which removed from the CFTC’s jurisdiction the extensive foreign exchange forward market, as well as additional financial instruments traded in the interbank market, such as mortgage purchase commitments, warrants, and government securities. 67 The Treasury Department, which regulates the banks that conduct this market, insisted upon the provision to ensure that banks’ activities would not be disrupted by CFTC interference. Because the banks that make the market are themselves regulated by federal agencies, the exception was not expected to create a regulatory void. 68 To prevent off-exchange currency transactions by individual traders, the CFTC has asserted that the Treasury amendment solely exempts interbank transactions. 69 Not all courts have agreed, however, with the CFTC’s interpretation. 70 Because the exemption expressly applies only to off-exchange transactions, exchange-traded currency futures are regulated by the CFTC. These

68. As the Senate report on the legislation indicated, the banks that made up most of this market were “more properly supervised” by the banking regulatory agencies than the new CFTC. Commodity Futures Trading Commission Act of 1974, S. Rep. No. 1131, 93d Cong., 2d Sess. 23 (1974).
70. Because the statutory language refers to the type of product, not the type of trader, 7 U.S.C. § 2(a)(1)(A)(ii) (1994), some courts have disagreed with the agency’s position that only interbank transactions are exempted. In Salomon Forex v. Tauber, 8 F.3d 966 (4th Cir. 1993), cert. denied, 114 S. Ct. 1540 (1994), for example, a commodities firm sued an individual customer who had not paid a $26 million trading loss. The customer was a wealthy surgeon who traded extensively in currencies and who was the only individual (as opposed to institutional) trader with whom the firm conducted business. The court held that the individually negotiated sales of foreign currency futures were within the exemption as off-exchange instruments, and thus did not relieve the individual of liability for his losses. Id. at 977. In CFTC v. Standard Forex, Comm. Fut. L. Rep. (CCH) ¶ 26,063, at 41,446 (S.D.N.Y. 1993), however, the court adopted the CFTC’s view of the statute’s scope. Id. at 41,455. It granted the CFTC’s request to enjoin the defendant’s marketing of contracts to buy and sell British pounds to members of the public, finding a congressional purpose to exempt only the interbank market because those financial institutions were already regulated. Id. at 41,454.
products were developed by the exchanges for individuals who wanted to trade in currencies but, lacking the financial wherewithal for banks to be willing to trade with them, did not have access to the off-exchange interbank market. While the cases under the Treasury amendment have involved traditional products specified in the statute, such as currency futures and options, major financial innovations offered by banks, such as swap contracts, seemingly covered by the exemption, have been the subject of substantial regulatory controversy.\footnote{See infra text accompanying notes 151-160.}

\section*{3. Authority of the CFTC.}

Once a contract has been shown to be a futures contract and a contract market has been designated, a panoply of other regulations involving the contract's marketing and trading comes into effect.\footnote{The Commodity Exchange Act is codified at 7 U.S.C. §§ 1-25 (1994). Details on all the provisions mentioned in the text can be found in 1-3 \textsc{Johnson & Hazen}, supra note 55.} Brokerage firms that sell futures contracts, referred to as futures commission merchants (FCMs), must register with the CFTC and comply with minimum capital, reporting, and recordkeeping requirements, and segregate customers' funds and securities from their own and other customers' accounts. Other market professionals, such as introducing brokers (sales personnel who solicit or accept trade orders but do not maintain customer accounts), floor brokers (individuals or firms who execute orders on exchange trading floors), commodity trading advisors (persons in the business of rendering advice about commodities), and commodity pool operators (the futures analogy to a mutual fund), must also register with the agency.

The regulatory regime includes a strong self-regulatory component, typical of the federal regulation of financial markets. Much of the CFTC's registration responsibilities are delegated to a statutorily recognized private organization of market professionals, the National Futures Association (NFA), and the futures exchanges are statutorily responsible for initiating and enforcing rules regulating participant conduct and ensuring compliance with CEA provisions. In addition, the CFTC requires exchanges to set speculative position limits (in cases in which it has not set such a limit itself), restricting the number of contracts that can be held at any point in time by a trader not engaging in "bona fide hedging" transactions.

The futures regulatory regime seeks to maintain market integrity by ensuring that futures markets are competitive, as well as by directly regulating the key participants. Numerous statutory provisions seek to establish the competitive execution of futures trades. For example,
wash sales (transactions that give the appearance of a purchase or sale but that avoid any change in ownership), fictitious trades, and non-competitive trading (such as filling one order by offsetting it against another customer's order without the customer's consent, or taking the other side of a customer's trade without his prior consent) are prohibited. The purpose of such prohibitions is to ensure that futures market prices are competitively set, and hence not distorted. The underlying assumption is that centralized open-outcry exchange markets, where transaction prices are immediately and publicly observed, best ensure a competitive marketplace.

Another component of the regulatory regime's defense of market integrity is the prevention of market manipulation. As with protection of competitive futures market pricing, market manipulation was a critical concern to the legislators establishing the regulatory regime, legislators whose constituents were farmers and others dealing in the underlying commodities on which futures contracts were written, because of the close connection between futures and spot market prices. Manipulation, a term generally used to refer to activity to make market prices artificial, is not, however, defined in the statute. The absence of a statutory definition is said to be due to concern that providing a definition might exclude some conduct that the CFTC would wish to prohibit. Of course, from the trader's perspective, the lack of a definition renders it difficult to determine whether particular conduct is illegal.

Manipulation is related to, and interchanged with, notions of a market "corner" (control or domination of the available supply of a cash commodity) or a market "squeeze" (control or domination of a futures market under market conditions in which cash supplies are insufficient to meet the futures contracts' delivery demand), which create artificially high prices and are more readily defined. The idea of manipulation in a futures market is based on the following scenario. If the holder of a large number of long positions in a futures contract that is about to expire also holds a large proportion of the contract's deliverable supply, he could impose substantial losses on the shorts by insisting on taking delivery on his contracts and then charging very high ("artificial") prices in the cash market as the shorts

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73. 7 U.S.C. § 6c.
74. See 7 U.S.C. §§ 2a(ii)(II), 7(4).
75. Manipulation is likewise prohibited, but not defined, in the securities laws. 1 THOMAS A. RUSSO, REGULATION OF THE COMMODITIES FUTURES AND OPTIONS MARKETS ch. 12, at 12-13 (May 1993).
76. Id. at 12-13 to -14.
attempt to cover their contracts. The difficulty with this concept is that activities claimed to be manipulation often cannot be distinguished from legitimate market behavior. As a consequence, in the case law, manipulation devolves into mind-numbing efforts at determining traders' specific intentions to manipulate and establishing that the market price was artificial.77

The CFTC has numerous enforcement powers at its disposal to prevent market manipulation, in addition to its power to review contracts for trading designation.78 For example, it possesses the authority to issue cease-and-desist orders and civil penalties against individual manipulators and exchanges for not preventing manipulation,79 to bring injunctive actions in federal court,80 and to issue emergency orders to exchanges to prevent actual or threatened manipulation.81 Manipulation is also made a felony punishable by fine or imprisonment.82

Market manipulation by a downward manipulation of price (accumulating large short and spot market positions and insisting on making delivery) is extremely rare, with few reported cases, and it is theoretically difficult to understand how such a manipulation could be successfully undertaken.83 Substantial capital would be required to finance the cash market purchases necessary to succeed in a downward market manipulation. This is in contrast to an upward price manipulation scheme, which requires no such capital as the requisite cash market conditions—commodity shortages—often occur naturally, such as after a natural disaster. In addition, as Pirrong et al. point out, given the symmetry of opposing trading positions, "the conditions that make long manipulation profitable—rapidly increasing costs of making delivery combined with relatively constant marginal costs of taking delivery—make short manipulation unprofitable."84 Because the conditions favorable for long manipulation are more likely to recur than those favorable for short manipulation, "only one form of manipulation [long manipulation] should predominate."85

78. See supra notes 53-54 and accompanying text.
80. 7 U.S.C. § 13a-1.
81. 7 U.S.C. §§ 9, 12a(9).
82. 7 U.S.C. §§ 13(a)(2), 13b.
83. See 3 JOHNSON & HAZEN, supra note 55, § 5.06, at 12-13.
85. Id.
Since upward price manipulation is the more realistic scenario, and the shorts are typically commercial hedgers (in particular, farmers, who are a key political constituency in the regulation of futures markets and take short positions when they enter the market to hedge), it is not surprising that market manipulation, namely, protection of shorts, is a key regulatory focus.86

The depth of the markets underlying financial futures has generally made market manipulation less of a concern than in agricultural markets because cornering would be extremely expensive, if not impossible.87 Moreover, to reduce the risk of manipulation, as is the case with agricultural futures, financial futures fixed income contracts typically can be satisfied by the delivery of more than one issue in the appropriate maturity range, making it more difficult to corner the market. Some contracts eliminate the matter entirely as they are cash-settled only (stock index and Eurodollar futures).

It should be noted that there is a key trade-off in contract design concerning delivery terms. The more flexible the delivery terms, the less manipulable the contract (a squeeze or corner is less likely because more varieties of the commodity are available for the shorts to fulfill their obligations). But the more flexibility in delivery, the less valuable the contract is for commercial users. Variety in deliverable product makes the commodity underlying the contract less homogeneous, which reduces the effectiveness of hedging because the relation between futures and spot prices is less precise. It also makes exercise undesirable as a means of obtaining the commodity because the long cannot control the quality of the good received.

D. Uses of Futures Contracts

The principal business use of futures contracts is precisely the same as that of forward contracts, management of price risk. Buyers of futures contracts seek to guarantee the price they will pay in the future for commodities needed for their business at a later date, and

86. Of course, farmers can benefit on the cash side from upward manipulation. In fact, as the prime movers in the federal regulation of futures markets, their concern, historically, was alleged downward manipulation of prices and not upward price manipulation. See generally Hearings, supra note 57. In the 1920s, few farmers hedged using futures. Id.

sellers of such contracts seek to guarantee the price they will receive when they sell commodities produced by their business in the future. While it is possible that both sides to a futures contract are hedgers (for example, a farmer sells a wheat contract to a miller), usually hedgers are shifting risk to investors who buy and sell futures in order to speculate about future price levels of the commodity underlying the futures contract. Speculators are willing to assume price risk in exchange for the possibility of making profits.

Speculators could also place their bets on price movements by purchasing or selling the underlying assets, but they can make bigger profits in derivative markets. Trading costs are lower, and derivatives offer the benefit of leverage—much less money has to be put down up front to assume a position. For as previously noted, the futures margin amount is only a small percentage of the value of the underlying asset. In addition, futures markets provide the most convenient method of speculating on price movements because of their unique offsetting feature, which eliminates the possibility of investors having to take possession of a physical commodity at contract expiration. In the public imagination, speculator is a decidedly pejorative term. But the speculator’s function in futures markets is absolutely essential. If speculators did not transact in futures markets, businesses could not manage price risks as efficiently. The consequent higher cost of risk would make society worse off, as that cost would be transmitted into higher product prices.

Just as are agricultural commodity futures, financial futures are used to manage price risk. Treasury bond and note futures contracts can be used to hedge the price risk in positions in underlying government securities, as well as in other fixed-income securities, such as corporate bonds or mortgage-backed securities (the risk from changing interest rates, also termed interest rate risk). Stock index futures contracts can be used to hedge the risk of changes in the value of a

88. Because the asset hedged may not be identical to the asset underlying the futures contract, futures hedgers replace price risk with what is referred to as basis risk. The basis is defined as the difference between the spot price of the asset being hedged and the futures price of the contract used for the hedge, and it equals the cost of carry. See supra p. 14. This difference may change over the life of the hedge because the spot and futures prices may change by unequal amounts, and be positive or negative when the hedge ends. If the hedged asset is the same as the asset underlying the futures contract, then the basis is zero at the contract’s expiration because arbitrage forces the two prices to converge. The closer the correlation of changes in the price of the asset to be hedged and the changes in the price of the futures contract, the lower the basis risk. The change in the basis is, in any event, less variable than the change in an asset’s price, and therefore, a hedged position is less risky than an unhedged one. For a more technical discussion of the basis and hedging, see CHANCE, supra note 21, at 354-59.
stock portfolio.\textsuperscript{89} Finally, swap dealers use financial futures to hedge the residual risk of their swap portfolio that arises from holding non-matched swaps.\textsuperscript{90}

One common hedging use of financial futures entails establishing a futures position as a temporary substitute for transactions to be made in the cash market at a later date. This type of transaction is called an anticipatory hedge. Consider a pension fund manager, for example, who knows that in two months he will receive a cash inflow (the employer's periodic contribution) that is to be invested in fixed-income securities. This fund manager might be concerned that the price of Treasury bonds will be higher in two months than they are today (a change resulting from declining interest rates). The fund manager does not have the cash to purchase the bonds today, but he can hedge the risk of higher prices and lock in the current price by taking a long Treasury bond futures position, which sets the bonds' purchase price at the current futures price.

The opposite strategy applies to the pension fund manager who knows that, in two months, the fund's beneficiaries must be paid a specified amount, which will necessitate liquidating a portion of the fund's portfolio at that time. If the value of the bonds the manager intends to sell declines over the next two months, then he will have to sell more bonds to obtain the cash needed for the fund payouts. The manager can reduce this price risk and lock in the price of the bonds that will be liquidated today by selling Treasury bond futures.

Financial futures have additional uses beyond eliminating or hedging exposure due to changes in interest rates or stock prices. Investment managers may use futures as a cheaper means of achieving portfolio goals, such as maintaining particular asset allocations or portfolio risk levels. For example, stock index futures can be used as a substitute for holding an index portfolio of stocks, and fixed-income futures can be used as a substitute for holding fixed-income securities.

To illustrate, suppose a pension fund manager wants to shift the fund's current allocation between bonds and stocks by $100 million. The manager could sell $100 million of stocks and buy $100 million of bonds with the proceeds, incurring transaction costs of commissions and bid-ask spreads, and potentially bearing market-impact costs (the

\textsuperscript{89} A dynamic form of hedging with stock index futures to replicate a protective put option strategy, \textit{see infra} part III.C, known as portfolio insurance, was popular with institutional investors until the 1987 stock market crash, when the strategy proved ineffective because the fast-moving, one-sided selling demand during the crash prevented hedge adjustment. \textit{See} Hull, \textit{supra} note 44, at 318-21.

\textsuperscript{90} \textit{See infra} text accompanying notes 123-128.
adverse effect on price that a large trade may have). An alternative approach to achieving the desired allocation is to buy an appropriate number of interest rate futures and sell an appropriate number of stock index futures. This saves transaction costs because commissions and spreads for futures trading are lower than those for stock and bonds. For example, an institutional investor incurs a round-trip trading cost on a stock index futures contract of about $25, or less than .1% of the value of the contract, whereas the round-trip commission incurred on the underlying stock portfolio is much higher, approximately 1% of the portfolio's value. Using futures to reconfigure a portfolio also reduces market-impact costs because they are thicker markets. Futures positions are then slowly liquidated as cash positions are actually shifted. This can be done incrementally to ensure that the reconfiguration in the cash market will have no market impact.

Stock index futures can also be used to adjust a stock portfolio's beta (the sensitivity of changes in a portfolio's return to changes in the return on the market) to any desired level. Adjusting a portfolio's beta is a technique used by active fund managers to engage in "market timing" trading strategies, strategies that seek to profit by trades that anticipate market movements; that is, the manager "times" the market's moves by selling before the market drops, or buying before it rises. If the manager anticipates a rise in the market, he increases the portfolio's beta. This provides him with additional gains because higher beta stocks go up more than the market. If the manager thinks the market is going to fall, he decreases the portfolio's beta to reduce the portfolio's decline, because low beta stocks move less than the market moves. Putting aside the question whether market timing is

91. Morgan Stanley estimates that transaction costs in the stock index futures market are between 5 and 10% of those in the stock market. Fabozzi & Modigliani, supra note 38, at 321.
92. A simple example will clarify the use of futures to adjust a portfolio's beta. Suppose a manager holds a $10 million stock portfolio that has a beta of 1.2. The manager expects the market to decline steeply next month. If this occurs, the portfolio's loss will be greater than the market's decline because its beta is greater than 1 (by definition the market's beta). A portfolio beta of 1.2 means that the portfolio is 120% as volatile as the market. Therefore, the manager will want to reduce the portfolio's market exposure prior to the predicted market decline. Assume that the manager's target beta is .1, a level at which the portfolio's value will drop only by 10% as much as the market drops. By selling stock index futures contracts while holding on to the current stock portfolio, the manager can achieve this objective for his overall portfolio. Because the beta of a portfolio is the weighted sum of the betas of its component parts, the manager must solve the following problem: find the number of futures contracts that, when combined with the current stock portfolio, yields the desired portfolio, $10 million in stock with a beta of .1. Assuming that the S&P 500 futures' current price is 545, the contract value is $500 times the price, or $500 \times 545 = $272,500. Hence, the equation the manager must solve is: $10 million \times .1$ (desired port-
an effective strategy, it is cheaper to adjust a portfolio's beta by trading in stock index futures contracts than in actual stocks.

Another reason for adjusting a portfolio's beta is to eliminate market risk in order to bear idiosyncratic risk or to lock in existing portfolio gains. For example, if a money manager has private information that a particular stock is going to rise in value, or if he has accumulated a significant gain on a specific stock portfolio, then if the stock market declines, this would moderate or eliminate the potential gain on the stock portfolio in the former case and the realized gain in the latter case. By taking a short position in stock index futures, the manager eliminates the market risk of his portfolio, and thus is exposed solely to his portfolio stock's idiosyncratic risk.

E. Corporate Hedging

Several of the examples of the use of forward and futures contracts to manage risk have referred to corporate hedgers. It is not self-evident that strategies that make sense for individuals, such as a risk-averse farmer, make sense for public corporations, whose shareholders are likely to hold diversified stock portfolios and therefore cannot be described accurately as risk averse. This contention is a variant of Modigliani and Miller's irrelevance theorem, which states that under specified assumptions (such as no transaction costs or taxes), a firm

\[
\text{folio} = 10 \text{ million} \times 1.2 + N_r \times 272,500 \times 1
\]

(portfolio combining current stock portfolio and futures contracts), where \(N_r\) is the number of futures contracts needed for the strategy. The stock index futures have a beta of 1 because their value is derived from the underlying stocks that essentially constitute the market. Solving for \(N_r\), we obtain -0.37 contracts. Rounding to the nearest integer, the manager sells 40 S&P 500 futures contracts, which in combination with his existing $10 million of stock, results in a portfolio with a beta of .1.

93. There is little evidence that money managers perform better on average than the market. For a popular review of the literature see Burton G. Malkiel, A RANDOM WALK DOWN WALL STREET 157-83 (5th ed. 1990); for a more recent and more technical update see Burton G. Malkiel, RETURNS FROM INVESTING IN EQUITY MUTUAL FUNDS 1971 TO 1991, 50 J. FIN. 549 (1995). It is therefore improbable that money managers can accurately predict market movements so as to implement a consistently successful market timing strategy.

94. Besides the lower transaction costs of trading futures contracts rather than stocks, this strategy permits a more precise beta adjustment, with less difficulty than would be involved in direct stock sales. For instance, continuing with the example in note 92, supra, it would be difficult to find just the right set of stocks to attain the desired portfolio beta of .1, as low beta stocks are rare. Therefore, a reconstituted stock portfolio would be less diversified (exposed to more idiosyncratic or firm-specific risk) than the original portfolio. Note that modern portfolio theory is premised on the market pricing only market or systematic risk, and not diversifiable (idiosyncratic) risk, because no one will pay for risk that need not be borne. Beta is the measure of nondiversifiable market risk in one particular asset-pricing model, the capital-asset-pricing model. See generally ROSS ET AL., supra note 43, at 241-44.
cannot increase its value by a purely financial transaction, such as changing its capital structure.\footnote{Franco Modigliani \& Merton H. Miller, The Cost of Capital, Corporation Finance and the Theory of Investment, 48 AM. ECON. REV. 261 (1958).}

Using the irrelevance theorem in the hedging context, the claim is that if there are two firms, $S$ and $H$, which are completely identical except that $H$ hedges its risk and buys one future for every share, $H$ shares cannot sell for more than $S$ shares (that is, hedging does not increase firm value). For if $H$ shares sold for more than $S$ shares, then an $H$ shareholder could sell his $H$ share and use the proceeds to buy an $S$ share and a futures contract and earn arbitrage profits. This strategy produces an initial net cash inflow because the price of $H$ is assumed to be higher than the price of $S$ and there is no up-front payment for a futures contract. But the payoff thereafter is the same, because the investor receives the same payoff from holding an $S$ share and a futures contract as he would have received had he simply held the $H$ share. Similar arbitrage actions by other $H$ shareholders will push up the price of $S$ and lower the price of $H$, eliminating the difference.\footnote{See Darrell Duffie, Futures Markets 228 (1989).}

There are, however, limitations with this analysis: there are transaction costs and taxes in the real world. First, for the irrelevance theorem to hold in our example, it must be as cheap for investors to hedge as it is for firms. This may not be the case. The greater volume of the firm's futures trading compared to the trades of each shareholder makes it likely that its brokerage fees will be less than the aggregate of individual shareholders similarly hedging (there are economies of scale in trading). More important, the firm will know more accurately its production needs, and hence what futures transactions it must undertake, than will its investors, and it may be very expensive or infeasible (if, for instance, there are strategic business reasons to keep production requirements secret from competitors) to provide the information to the shareholders.\footnote{Id. at 230.} Nevertheless, as Duffie notes, to the extent that shareholders are diversified (that is, they own shares in firms that supply the input whose price risk the firms are hedging), the high transaction costs argument is less persuasive because the shareholders would not need to transact in futures to hedge the firm's input price risk.\footnote{Id.}

Second, hedging will benefit even risk-neutral shareholders, if the shareholders bear bankruptcy costs, because hedging lessens the like-
lihood of bankruptcy by reducing the variability of firm cash flows.\textsuperscript{99} This does not appear to be a very likely explanation, however, as many active corporate hedgers, such as the McDonald's and Sara Lee Corporations, are not seriously concerned about going bankrupt.

Third, there may be tax advantages to hedging. If a firm's income lies within the range where the tax rate schedule is convex,\textsuperscript{100} then the firm is better off hedging and paying a tax on expected income rather than an expected tax.\textsuperscript{101} However, it should be pointed out that large corporations, like McDonald's, which have active hedging programs, are unlikely to be within the kink in the income tax rate curve where the tax benefits matter. Such corporations do not have losses and the progressivity in corporate rates ends at very low income levels.\textsuperscript{102}

Fourth, information asymmetry between managers and shareholders concerning management performance may make hedging valuable to shareholders. If we make the plausible assumption that managers are better informed than shareholders concerning how hard they are working, then managers are likely to know more than shareholders about whether a firm's poor performance is due to the managers' lack of effort or bad luck (that is, external events outside of management's control). If a corporation hedges against losses from

\textsuperscript{99} Id. at 231. As Smith, Smithson, and Wilford point out, even if financial distress does not lead to bankruptcy, there are many indirect costs in such situations, such as higher contracting costs with suppliers who are concerned about the firm's ability to perform future commitments and offer less favorable credit terms. Clifford W. Smith, Jr. et al., \textit{Five Reasons Why Companies Should Manage Risk, in THE HANDBOOK OF CURRENCY AND INTEREST RATE RISK MANAGEMENT}, supra note 27, at 19-1, 19-11.

\textsuperscript{100} Convexity refers to kinks in a tax schedule—for example, progressive rates, limits on loss refundability or carryover, and the alternative minimum tax or windfall profits tax—that change the tax due discontinuously at the kink.

\textsuperscript{101} Smith et al., supra note 99, at 19-6 to 19-9. With convexity in the tax rate schedule, the tax on expected income is not equal to the expected tax. This can be readily seen by reviewing an example in Smith, Smithson, and Wilford. If a firm will either lose $400 or earn $600, at a 20\% tax rate that fully refunds losses, the firm's expected tax is .5(-400)(.2) + .5(600)(.2) = 20, which is the same as the tax on expected income, .2[.5(-400) + (.5)(600)] = 20. But if only 10\% of losses are refunded (that is, there is only a 50\% loss carryforward), then the expected tax is .5(-400)(.1) + .5(600)(.2) = 40. The expected income, and hence the tax on that amount, however, is unchanged at 20. The firm can therefore save $20 in taxes by hedging, which ensures that its income is 100 rather than only expected to be 100 with a 50:50 chance of 600 or -400. Id. at 19-8.

\textsuperscript{102} To continue with Smith, Smithson, and Wilford's example, the benefit depends on how much of the pretax income lies in the area of convexity, that is, the spread of income around zero, because the kink is created by the differential tax treatment of losses and gains. If the range of income in the example is shifted to the right, to -200 and +800 instead of -400 and +600, then less of the distribution of pretax income would be around the kink and the benefit of hedging for the firm in the example would fall from $20 to $10. Id. at 19-9.
such exogenous events, then the shareholders will be better able to observe the managers' performance. This is because the hedge enables shareholders to eliminate, as best as possible, the uncertainty or noise of firm performance generated by price risk, and thus, isolate the managers' effort.\textsuperscript{103} 

A related explanation of corporate hedging is that if management is risk averse, it will require more compensation to bear risk (that is, to work for a firm with variable cash flows). Hedging will smooth out the firm's cash flows, and therefore should lower the level of fixed compensation that management requires. This magnifies the effect of hedging to reward managers' efforts, now more observable, rather than managers' luck, because a risk-averse manager whose compensation depends on events outside of his control will require more compensation. It should be noted that a managerialist explanation of hedging, which is the implication of the irrelevance theorem, adopts this last motivation—managers' risk aversion—but sees no compensating benefit to shareholders.\textsuperscript{104} The managerialist explanation does not expect the shareholders to realize any reduction in compensation costs from corporate hedging. 

Finally, hedging may mitigate the problem of inefficient investment by firms. If capital market imperfections make internally generated funds cheaper than externally raised funds, then when a firm's cash flows drop it will underinvest rather than bear the increased cost of external financing.\textsuperscript{105} Hedging is valuable under these circumstances because, by reducing the variability of the firm's cash flows, it

\textsuperscript{103} This argument is similar to the relative performance evaluation literature on management compensation. \textit{See}, e.g., Rick Antle & Abbie Smith, \textit{An Empirical Investigation of the Relative Performance Evaluation of Corporate Executives}, 24 J. ACCT. RES. 1, 32-33 (Spring 1986).

\textsuperscript{104} Unlike shareholders holding diversified portfolios, managers are subject to nondiversifiable, firm-specific risk because the bulk of their wealth comes from their employment income, which often has a performance-based component, and cannot be diversified away. Human capital is not a tradable asset: imperfections in the capital market prevent managers from being able to borrow today, on the basis of their future earnings, and invest the proceeds in a diversified stock portfolio. The primary imperfection involves lenders' recognition of the moral hazard problem, that the probability of repayment is in the hands of the manager who, once he has the funds, may not work hard and may never achieve a future income large enough to repay the loan. A similar argument has been used to explain conglomerate mergers as a mechanism by which managers reduce firm-specific risk. \textit{See} Yakov Amihud & Baruch Lev, \textit{Risk Reduction as a Managerial Motive for Conglomerate Mergers}, 12 Bell. J. Econ. 605, 606-09 (1981).

\textsuperscript{105} Kenneth A. Froot et al., \textit{Risk Management: Coordinating Corporate Investment and Financing Policies}, 48 J. Fin. 1629 (1999). Froot et al. offer several possible reasons for such capital market imperfections: asymmetric information between managers and outside investors concerning firm cash flows, bankruptcy costs, and agency costs (managers prefer not to be monitored and thus act as if external financing is more costly). \textit{Id.} at 1633-34.
ensures the availability of the cheaper capital source, thereby eliminating the reason to reduce investment when cash flows decline.

Of course, none of these explanations proves that corporate hedging is in fact being undertaken in the shareholders' interest, to maximize the value of the firm, as opposed to serving the managers' interests. But the explanations are at least suggestive of reasons why the irrelevance theorem is inapplicable and why there is value in corporate hedging. There has not, in fact, been sufficient empirical research on firms' hedging practices to enable us to determine which, if any, of these explanations is correct. This is due, in part, to the inadequacy of disclosure practices. Most studies distinguish firms simply by whether they use derivatives or not, as indicated in survey responses or identified by searching financial statements for references to particular instruments. These studies generally find a positive correlation between use of derivative instruments and the probability of financial distress and sometimes find a positive correlation between derivatives use and more convex tax schedules. The crudeness of the data limits the reliability of conclusions, however, because there is no way to determine the actual uses (hedging or speculative) being made of the instruments identified in surveys or financial statements.

One study, which overcame this problem by using a unique data set of gold mining companies whose specific hedging practices are disclosed in certain analyst research reports, found that firms' hedging practices were more consistent with managerial risk aversion than financial distress, tax, or underinvestment explanations. While this is a troubling result from the viewpoint of the theory of the firm, we do not know how representative the derivatives' usage of the gold mining industry is of general corporate practice.

In sum, corporate hedging is an area in which the incentive considerations are not very well understood and are not often acknowledged in the literature. In this regard, one proposal that certainly would benefit shareholders is corporate disclosure of hedging policies. Whether or not corporate hedging benefits shareholders, shareholders would increase, not decrease, their risk if they hedged the firm's risk on their own at the same time that the firm was itself


hedging. More precise disclosure of hedging practices would prevent this scenario. It should be noted that, if the corporate entity is a federally insured bank, then while hedging may be of questionable value to the bank's shareholders, the practice is plainly in the interest of the federal government, the deposit insurer, and the true residual claimant.\textsuperscript{109} As some commentators have contended, had thrift institutions better managed their asset and liability portfolios by hedging with some of today's more innovative products, such as swaps, the federal bailout of the savings and loan industry might have been avoided.\textsuperscript{110}

III. Options

A. Essential Institutional Features

An option is a contract that gives the owner the right to buy or sell an asset at a specified price (termed the exercise or strike price) on or before a specified future date. Options to buy an underlying asset are referred to as calls; options to sell an underlying asset are referred to as puts. The buyer of a call, like the long in a futures contract, is betting that prices will rise above the exercise price. The buyer of a put, like the short in a futures contract, is betting that prices will fall. Options that cannot be exercised except upon maturity (the expiration date) are called European options, while those that can be exercised at any time up to the expiration date are called American options. Currently, all U.S. exchange-traded individual stock options are American options, but some stock index options are European.

Option contracts date from Phoenician and Roman contracts on the delivery of goods transported by ship and, in more modern times, from option contracts on Dutch tulip bulbs in the 1600s.\textsuperscript{111} Traded options date from the eighteenth century in the United States, although the first options traded on an organized exchange—stock options—were introduced just two decades ago,\textsuperscript{112} by the Chicago Board Options Exchange (CBOE), a unit of the CBOT. Options traded on exchanges today cover numerous assets, including individ-

\textsuperscript{109} See infra note 115 and accompanying text.


\textsuperscript{112} Id. at 15-16.
ual stocks, stock indices, currencies, government bonds, and futures contracts involving agricultural commodities, metals, oil, currency, and financial instruments. Options are also traded over-the-counter (off-exchange) by banks and other financial institutions.

As is true of the futures markets, the market in options on financial futures dwarfs that of all others. In 1991 the total face value of options on short-term interest rate futures contracts in the United States alone was $628 billion and that of options on currencies was $32 billion. The face value of the over-the-counter option market is estimated to be more than ten times that of the exchange-traded market.

Options create rights, not obligations. The purchaser of an option can choose not to exercise the right to buy or sell the underlying asset without penalty. In contrast, the purchaser of a futures contract cannot walk away from his commitment if he still holds the contract at its expiration date. Thus, the holder of an option does not have to exercise if to do so would cause a loss. The seller of the option, who is also called the option's writer, is, however, obligated to perform. Option buyers are therefore required to make a payment to the option's writer upon contract initiation, referred to as the option premium, in contrast to the buyers of forwards and futures, who pay nothing to enter into a contract.

As a result of this contract structure of a one-sided obligation and premium payment, the maximum gain or loss on an option contract is not symmetrically unlimited for the parties as it is in forward and futures contracts. The option buyer's loss is limited to the premium payment because if he would lose money by exercising the option he does not do so, while the seller's gain is limited to the premium received for the option. However, for call options, the seller's loss, represented by the difference between the exercise price and asset value at the time of exercise, is theoretically unlimited, as is the buyer's gain. For put options, the seller's maximum loss and buyer's maximum gain is equal to the exercise price (the outcome when the stock price falls to zero).

A call option whose exercise price is below the stock price is said to be "in-the-money," while one whose exercise price is greater than the stock price is said to be "out-of-the-money." The converse is true.

113. GROUP OF 30, supra note 24, at 34 n.8. The General Accounting Office's estimate of the worldwide value for 1992 of exchange-traded interest rate and currency options, and off-exchange interest rate options is approximately $2 trillion. GAO REPORT, supra note 11, at 187.
114. CHANCE, supra note 21, at 26.
for a put option. Because the option investor's loss is limited—he does not have to exercise an out-of-the-money option—there is a discontinuity or kink in the option payoff function. When, at expiration, the option is out-of-the-money, the option holder earns no return, and when it is in-the-money the return is the difference between the stock and exercise price. Thus, the option holder's payoff at expiration dramatically changes as the stock price rises above the exercise price. The value of the option, accordingly, does not change in a one-to-one fashion with the stock price as does the value of a forward or futures contract; it does so only when the stock price exceeds the exercise price.

This nonlinear or discontinuous payoff structure makes option pricing far more complex than futures and forward contract pricing. It also means that the option holder benefits from increased risk (variance) in the underlying asset's returns. The option holder's downside loss is fixed regardless of how low the asset price drops (he loses only the previously paid premium) but he receives all of the upside return.115

There is one clearinghouse for all U.S. exchange-traded stock options, the Options Clearing Corporation (OCC). The OCC functions similarly to the futures exchanges' clearinghouses; it is an intermediary in all transactions and guarantees the sellers' performance. (Because premiums are paid up front, and buyers of options have no obligations, there is no issue of nonperformance on the long side of an option contract.) All option trades must be cleared through OCC members, who must meet minimum capital requirements and maintain margin accounts with the OCC.

Clearing firms, correspondingly, require margin deposits from the actual option writers if they do not already own the stock. If they own the stock, then the writers need deposit no more than the margin required for purchasing the stock itself. However, should the stock

115. This is why bank shareholders, unlike the federal government, would like their managers to take on increased risk. Because of deposit insurance, bank shareholders are equivalent to option holders, as they do not have to cover the deposits if risky loans produce a loss. Indeed, the same analysis applies to shareholders in general in a levered firm. These shareholders can be understood as having a put option on the firm because of limited liability. If the firm cannot pay off the bondholders at maturity, then the shareholders exercise their put: they "sell" the firm to the bondholders for the asset value, which is less than the bond value. If at maturity the value of the assets is greater than the bonds, then they do not exercise the put and simply repay the bondholders instead. Levered stock can also be characterized as a call option: if the firm's value exceeds the debt, the shareholders exercise the call and "buy" the firm from the bondholders by paying off the loan. They let the call expire if the firm value is less than the debt, leaving the firm to the bondholders. See Ross et al., supra note 43, at 684-42.
price rise above the exercise price, the maximum amount the investor may borrow on the stock is based on the lower exercise price rather than the stock price. An option whose writer owns the underlying asset is referred to as a covered option, while an option whose writer does not own the asset when it is written is referred to as a naked option. Naked options are obviously riskier than covered options (hence the higher margin requirement). If prices rise dramatically, a covered option writer will be able to perform because he has the asset on hand, whereas the naked writer has to go into the market to cover and may not have the cash to do so. The writer’s loss is the same in either case.

Option positions are not marked to market on a daily basis as are futures positions. This is not a surprising difference given the asymmetry of the obligation. If the option is worthless at expiration, the buyer does not owe the option writer any further payment. The profit or loss is unknown until expiration or exercise, and, in this sense, there is no daily loss or gain accumulating over a contract’s life.

B. Regulatory Regime

Stock options and options on securities are regulated by the Securities and Exchange Commission (SEC). Options on futures contracts, called commodity options, are regulated by the CFTC. Such options were prohibited by federal law until 1982, when the CFTC was authorized to permit commodity option trading on an experimental basis,

116 an experiment that was so successful that trading was permanently authorized in 1987. The regulatory regime for options thus depends on the underlying asset. For currency options, however, the regulatory regime is determined by the exchange upon which the option trades. Those traded on exchanges registered with the SEC (national stock exchanges) are regulated by the SEC, and those traded on

116. Prior to 1974 when all traded futures came to be regulated, options were traded on nonregulated commodities, as the statutory ban on options only applied to regulated commodities. With the inclusion of all futures under the CFTC’s jurisdiction in 1974, Congress instructed the CFTC to determine whether then-traded options on the newly covered contracts should also be banned. Without that proviso, the trading would have had to cease because the underlying assets were now regulated. As a result, the business would have moved abroad. In fact, one reason advanced for expanding regulation to all commodities was the inability of the existing regulatory agency to enjoin commodity option trading, or otherwise take action, regarding a highly publicized scandal in which a firm that had been selling naked options on unregulated commodities failed, producing $100 million in investor losses. Review of Commodity Exchange Act and Discussion of Possible Changes: Hearings Before the House Comm. on Agriculture, 98d Cong., 1st Sess. 1, 11 (1973) (statement of Rep. Neal Smith).
exchanges registered with the CFTC (futures exchanges) are regulated by the CFTC.

There is no economic reason for the fragmented regulatory treatment of options. This is underscored by the bizarre basis for the choice of regulator for exchange-traded currency options. The regime is simply the patchwork product of a political compromise in a longstanding jurisdictional turf battle between the SEC and the CFTC and their clientele exchanges.\(^ {117} \)

Section 9(b) of the Securities Exchange Act of 1934 authorizes the SEC to set the terms and conditions of exchange trading of options on equity securities.\(^ {118} \) Off-exchange traded options on exempted securities (government securities and securities issued by banks) are excluded from the SEC's jurisdiction.\(^ {119} \) The congressional committee that investigated the 1929 stock market crash and whose work led to the enactment of the federal securities laws had recommended banning options, but confronted with vigorous opposition from option dealers, Congress chose instead to require agency approval of option trading through its rulemaking authority.\(^ {120} \)

Security options trading is governed largely by a self-regulatory system of exchange and dealer association rules approved by the SEC. The option exchanges require all customer accounts for option trading to be specifically approved in writing and to meet strict suitability tests, such as the investor's reasonable ability to evaluate and bear the risks of option trades. These requirements reflect the greater risk of options investments compared to ordinary security investments. In addition, special disclosure documents must be transmitted to investors prior to trading. These documents are filed with the SEC for review and detail the unique features of options, including their risks.

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117. The SEC–CFTC jurisdictional accord is codified at 7 U.S.C. § 2a (1994). Former CFTC Chairman Philip Johnson, who fashioned the interagency accord divvying up options in 1982, has offered his view of the jurisdictional mess. See Philip M. Johnson, Reflections on CFTC/SEC Jurisdiction, in PHILIP M. JOHNSON & THOMAS L. HAZEN, COMMODITIES REGULATION 114-21 (2d ed. Supp. 1991), and JOHNSON & HAZEN, supra note 55, at 279. As Johnson discusses, the SEC's challenge to the CFTC's jurisdiction over futures on securities began as soon as the CFTC was created. But even when the agencies themselves do not dispute a jurisdictional issue, the futures exchanges have objected to encroachments on the CFTC's jurisdiction, and the courts have upheld their complaints. See, e.g., Board of Trade v. SEC, 677 F.2d 1137 (7th Cir.) (Ginnie Mae options), vacated as moot, 459 U.S. 1026 (1982); Chicago Mercantile Exch. v. SEC, 883 F.2d 537 (7th Cir. 1989) (Index Participation Units).


and the mechanisms of trading. Broker-dealers are subject to net capital requirements and option markets impose position limits on the number of contracts that can be held or exercised within a specified time period. Finally, the antifraud provisions governing transactions in securities are applicable to options on securities.\textsuperscript{121} Commodity option trading is regulated under the regime for futures already discussed.

C. Uses of Options

The uses of options are similar to those of forwards and futures, as hedges against price risk and as levered speculation. In what is known as a protective put strategy, an investor who seeks to protect a stock portfolio from price declines purchases put options on the stock, and thereby sets a floor value for his portfolio equal to the exercise price of the put. In contrast to a hedging strategy of selling futures against a long position in the cash market, buying put options permits an investor to gain from price increases because puts need not be exercised when the price rises. The gain in the cash market position, however, is reduced by the put premium.

An investor can eliminate risk entirely by properly combining a portfolio of options and underlying assets, analogous to how risk can be eliminated by combining a portfolio of offsetting futures and underlying asset positions. The hedge, however, is much more difficult to construct with options. This is due to the kink in the payoff function, the option's walk-away feature that limits option holders' losses and makes the pricing relation between the option and underlying asset nonlinear. Nonlinearity means that the number of options nec-

ecessary to hedge a cash position will vary with the asset price. As a result, an option-hedged portfolio must be continuously adjusted to maintain a risk-free position. Because the transaction costs of continuous adjustment are prohibitive, most such hedges are updated only periodically. Therefore, an investor hedging with options bears significant risk in the interim between portfolio adjustments.

The nonlinearity of option pricing does have benefits—it creates richer opportunities for speculative trading strategies than those attainable with futures. This constitutes options' great attraction. Through a judicious combination of options, investors can obtain virtually any different payoff function they wish. 122

IV. SWAPS

A. Essential Institutional Features

A swap is a contract between two parties, referred to as counterparties, to exchange a series of cash flows over time. A swap agreement specifies the currencies to be exchanged, rate of interest applicable, payment timetable, and ancillary issues bearing on the relationship between the counterparties. Swap payments are calculated on the basis of hypothetical quantities of the underlying asset referred to as "notionals." In most swaps other than currency swaps, the notional amount does not trade hands and is not at risk.

Swaps are customized contracts and they are not traded on exchanges. The primary dealers in swaps are commercial banks, as is true of the largest forward market, foreign currency. This fact is not fortuitous. Swaps developed, in part, as an offshoot of foreign currency transactions, for which banks provided the principal intermediation.

The International Swaps and Derivatives Association (ISDA), a trade association of swap dealers, has developed a standard form contract for swaps that defines the instruments' terms and the

122. The standard option texts all provide an introduction to the basic combinatorial trading strategies, such as spreads, straddles, strats, strips, and strangles. See, e.g., HULL, supra note 44, at 175-87. The trader who brought down Barings had, among other positions, assumed a very large short straddle in Nikkei 225 index options. See Sheryl WuDunn, Osaka, a Venue for Making Big Bets, N.Y. TIMES, Mar. 2, 1995, at D6. This strategy consists of selling an equal number of puts and calls with the same exercise price and expiration date on the same underlying asset. Such a strategy profits if the price of the asset stays within a narrow trading range around the exercise price. It is a highly risky strategy, because if the asset price moves substantially in any direction, the straddle writer loses. Unfortunately for the Barings trader, after he established his position there was a severe earthquake in Japan, and the Nikkei dropped substantially, falling way outside of the range in which his position was profitable. Id.
counterparties' responsibilities upon default or early termination. Standardized documentation is intended to mitigate or resolve legal questions surrounding a contract, particularly issues arising in the case of a counterparty's insolvency. The key price, duration, and quantity terms remain customized to the counterparties, in contrast with standardized futures contracts. The standardization in swap documentation is therefore directed at resolving legal uncertainty rather than enhancing market liquidity (product tradeability). Accordingly, swap agreements not only have greater variation in terms than futures contracts, but also are not tradable or assignable without both counterparties' consent. This restriction on transfer is an important protective feature for counterparties because the absence of a clearinghouse in the swap market requires a counterparty's creditworthiness to be ascertained and monitored.

The simplest interest rate swap, termed a "plain vanilla" swap, is a fixed-for-floating interest rate swap. In such a swap, one counterparty agrees to make fixed-rate payments to the other counterparty, who agrees to make floating-rate payments in return. The fixed-rate payer is conventionally characterized as holding the long position (the swap buyer), and the floating-rate payer is characterized as the short. In practice, rather than each counterparty paying its respective payment, only the differential between the counterparties' payments changes hands. That is, if the fixed-rate payment due is, say, $600,000 and the floating-rate payment $500,000, the fixed-rate payer pays $100,000 to the floating-rate payer. The most common floating rate used in swaps is the six- or three-month LIBOR (London Interbank Offered Rate), the rate of interest offered by banks on deposits by other banks in Eurocurrency markets. These are markets for non-domestic currencies: Eurodollar instruments are dollar-denominated instruments issued in a European country.

There are numerous variants on the plain vanilla interest rate swap. These will only be briefly mentioned here, as a detailed understanding of the permutations is not necessary to grasp the key economic and regulatory issues. Amortizing or accreting swaps are swaps in which payment amounts change over time (decreasing and increasing, respectively). An amortizing swap payment schedule reflects, for example, the declining payment schedule of an amortizing loan. Deferred swaps are swaps where the exchange of interest rate payments is deferred to a date later than the initiation of the contract. Basis swaps

123. If this seems confusing, consider the fixed payer as purchasing today, tomorrow's interest rate on a loan. He benefits if rates go up, just as the long in a wheat futures contract benefits if wheat prices rise.
are swaps in which both sides or legs of the swap float but are pegged to different interest rate indexes. For example, one side may be pegged to LIBOR and the other to U.S. Treasury bill or commercial paper rates. Callable or putable swaps are swap contracts where the fixed-rate payer, or floating-rate payer, respectively, has the right to terminate the contract early.

There are also options on swaps, called swaptions, that give the holder the right to enter into a specified swap at a later date, or to terminate or extend an existing swap at a later date. Interest rate swaps are often combined with specific interest rate options, termed caps or floors, that fix, respectively, a maximum or minimum interest rate payment for the floating side of the swap contract. A contract that combines a cap and a floor is called a collar. A collar is typically used by a floating-rate payer that wants to limit its risk by buying a cap, but finds the cap too expensive. The floating-rate payer can reduce the cost of the cap to an affordable level by selling a floor, thus constructing a collar. Depending on the trigger rates of the cap and the floor, the premium received for the floor may exactly offset the premium paid for the cap. The floating-rate payer gives up some of the gain it would receive from falling rates to reduce the cost of limiting the losses it would bear from rising rates. Finally, swaps and embedded options where a multiplier is used to determine the interest rate payments are called turbo or power swaps and options. A multiplier enables the swap investor to leverage his position. There is a substantial market for swap-related options. In 1991 the total notional principal outstanding of caps, floors, collars, and swaptions was $577 billion.\(^{124}\)

In a typical plain vanilla transaction, a financial institution dealing in swaps enters into a swap contract with one counterparty in which the dealer pays a floating rate and receives a fixed rate, and an offsetting contract with another counterparty in which the dealer pays fixed and receives floating. In essence, the counterparties’ payments are exchanged, but it is the dealer who is liable on their respective contracts. Thus, the dealer’s creditworthiness is all that matters to each particular counterparty. The dealer earns a margin equal to the differential in fixed rates charged across the two contracts for its services, equivalent to a bid-ask spread, the difference between the amount a dealer offers to pay for an instrument and what the dealer will sell it for.

\(^{124}\) Group of 30, supra note 24, at 34 n.7.
The most common swap after the interest rate swap is the currency swap. Currency swaps involve the exchange of currencies as well as fixed-for-floating interest rate exchanges, although the simplest currency swaps exchange only currencies with both sides paying fixed rates. The notional principal amount is exchanged at the beginning and end of a currency swap because, in contrast to the notional principal in an interest rate swap, the value of the principal in a currency rate swap will change over the contract's term if exchange rates vary from the contract's start to finish.

Because a swap contract consists of a series of cash payments made according to a prespecified formula, in which each period's floating-rate payment is set by the rate in effect in the prior period, it is equivalent to a portfolio of forward contracts. Thus a taxonomy of generic derivatives could include swaps as a species of forward contract. It is helpful, however, to distinguish swap contracts for two reasons. First, swaps are not truly a redundant instrument. The transaction costs of interest rate swaps are lower, for instance, than packages of interest rate forward contracts because each forward contract has to be negotiated separately, and the rapid growth of the swap market has made it more liquid than the forward market, particularly forward contracts with long maturity terms. Second, the swap market has been a principal focus of current regulatory concern.

Swap contracts originated in loan agreements initiated in the United Kingdom in the 1970s in order to avoid government controls on foreign exchange transactions. These controls were intended to prevent the outflow of capital into foreign investments. For instance, a U.S. corporation needing to finance the operations of its U.K. subsidiary, and a U.K. firm needing to finance a U.S. subsidiary, would enter into either "parallel" or "back-to-back" loan contracts. In this dual-loan arrangement, the U.S. corporation borrowed funds in its domestic market and lent the dollars it borrowed to the U.K. firm. The U.K. firm borrowed an equivalent amount in its domestic market and lent the pounds sterling it borrowed to the U.S. firm. Each firm was thereby able to access the capital market of a foreign country and fund its subsidiary's operations without any exchange of currency in the foreign exchange market. Such an arrangement avoided the substantial tax imposed by the British government's regulation of foreign exchange transactions involving its own currency.

126. See, e.g., GAO Report, supra note 11.
127. The following discussion of these contracts is based on John F. Marshall & Kenneth R. Kapner, Understanding Swaps 4-5 (1993).
At the same time that it solved the problem of foreign investment access, the dual-loan arrangement created new problems. One problem it created was a need for matching—the U.S. corporation needed to find a U.K. firm with identical financial needs, in terms of interest, principal, and timing of payments. Another problem with the dual-loan structure was that if one firm defaulted on its obligation to the other, the second firm was not relieved of its obligation to the first, because the arrangement consisted of two independent loan contracts. These problems were resolved with the development of swaps. Swaps mitigate the default problem by creating a single agreement to exchange payments, thereby clarifying the parties' set-off rights. The matching problem also was solved. As the swap market developed, financial institutions intervened as brokers and dealers who "warehoused" swaps, that is, they immediately assumed the other side of a swap contract for a customer and thereafter arranged an offsetting swap or otherwise hedged the risk of unmatched contracts by transactions in futures.

In 1979 Salomon Brothers wrote the first currency swap for IBM and the World Bank. Interest rate swaps were created in 1981, and were publicized in a transaction by Deutsche Bank in 1982.\textsuperscript{128} The swap market's growth has been as explosive as that of other derivative markets (see Table 1).\textsuperscript{129} The size of the swap market is difficult to ascertain precisely because the market is an international over-the-counter dealer market and, unlike contracts traded on public exchanges, transactions are not reported to authorities. At the end of 1991, the outstanding notional principal amount for the two most prevalent swap types, interest rate and currency swaps, was $3.87 trillion.\textsuperscript{130} Of this sum, $1.95 trillion was new contracts written in 1991.\textsuperscript{131} Of course, using notional values to measure the swap market's size drastically overstates it, as notionals are only baseline figures used for calculating contractual payments. The level of funds actually at risk in swap contracts has been estimated at about two percent of the notional amount.\textsuperscript{132}

Two swap types of more recent origin are commodity and equity swaps. Commodity swaps involve fixed-for-floating rate exchanges

\textsuperscript{128} For a brief history of this period of swap development, see Satyajeet Das, Swaps & Derivative Financing 15 (rev. ed. 1993).

\textsuperscript{129} See supra p. 5.

\textsuperscript{130} Group of 30, supra note 24, at 54. The General Accounting Office estimated that in 1992 the notional amount for such swaps was $4.7 trillion. GAO Report, supra note 11, at 187.

\textsuperscript{131} Group of 30, supra note 24, at 54.

\textsuperscript{132} Id. at 59.
where the notional is some quantity of a commodity, such as oil, and the floating price is an average of periodic observations of the spot price of the commodity. For example, an oil producer can fix the price it receives for oil for several years by entering into a commodity swap, with the notional a specified quantity of oil, in which the producer pays the average daily spot price for oil and receives a specified fixed rate per barrel. Equity swaps have floating rates pegged to the total return on some stock index, such as the S & P 500 index. As might be expected of more recent products, the commodity and equity swap markets are far smaller than the interest rate and currency swap markets—in 1992 they totaled $28 billion in notional principal.133

B. Credit and Legal Risk in Swap Contracts

As a consequence of the swap market's being an off-exchange (over-the-counter) market with no clearinghouse arrangement, participants in swaps are subject to the risk of their counterparty's default. This is termed credit risk. Swap market participants therefore tend to have the very highest credit ratings. Parties seeking to enter into a swap will not transact with poor credit risks, and low credit counterparties typically must post collateral or provide other security guaranteeing payment in order to participate in the market. In fact, securities firms desiring to enter the market as dealers have established separately capitalized subsidiaries that obtain AAA credit ratings to transact their swap business in order to compete with commercial banks, whose substantial capital gives them the highest credit ratings. A recent survey of major swap dealers found that ninety-four percent of their business (by notional amount or by current credit exposure) was with counterparties rated at investment grade (BBB or better).134 The concern for creditworthiness contributes to swap market concentration.135 Few firms have both the resources necessary to be as creditworthy as dealers and the ability to invest in the complex risk-management systems necessary to run a swap operation successfully.

It is important to recognize that the credit risk from an interest rate swap is considerably less than the credit risk of a loan, a bank's

133. Id. at 57.
134. GAO REPORT, supra note 11, at 159.
135. Eight U.S. commercial bank swap dealers accounted for 56% (notional amount) of interest rate and currency swaps worldwide as of 1991, and the top seven U.S. bank swap dealers (by notional amount) accounted for more than 90% of all U.S. bank derivatives activity as of 1992. Id. at 36.
more conventional business activity. In contrast to a loan, no principal is exchanged in a swap. Therefore, the principal amount is not a liability (this is why measuring the market by notional amount is misleading). The loss upon a counterparty default is a swap's replacement cost, which is the difference in value between the initial contract terms and current market terms for an identical contract. For example, if a dealer's defaulting counterparty is the fixed-rate receiver and if interest rates have risen in the interim, then the fixed rate required to enter into a new swap of the same duration will also have risen. Consequently, the dealer will have to pay a higher fixed rate on the replacement swap or pay the present value of the difference up front to induce someone to assume the defaulting counterparty's position in the original swap contract.

While there is always credit risk with a loan (payments go only to the lending bank), swap counterparties experience a loss upon a default only when the value of the swap is positive, for instance, when the nondefaulting counterparty, and not the defaulting counterparty, is netting a cash inflow on the payments exchange. Thus, a counterparty's insolvency is a necessary but not sufficient condition for a swap dealer's loss. In fact, for several reasons, a counterparty's probability of default is often independent of the value of its position in a swap contract. First, swaps may be hedged or represent only a very small percent of a firm's total portfolio of assets and liabilities. Second, the factors affecting the value of the swap, such as interest rates, may be unrelated to the factors affecting a counterparty's financial condition, such as changes in demand for a firm's products, or, in the case of a bank, Third World debt or real estate exposure.\footnote{136. See Hull, supra note 44, at 457-58. Gregory Duffee contends that the fixed-payment receiver bears more credit risk than the fixed-payment payer because the probability of default is positively correlated with declines in interest rates and it is the fixed receiver (that is, floating payer) whose side of a swap has positive value in such an environment. Gregory R. Duffee, On Measuring Credit Risks of Derivative Instruments, Federal Reserve Bd., Finance and Economics Discussion Series, Research Paper No. 94-27 passim (Sept. 1994).}

In addition to credit risk, swap market transactors may bear significant legal risks not shared by futures market participants. These risks include corporate authority or capacity to enter into a swap contract, and contract enforceability in bankruptcy or insolvency. The legal risk involving corporate authority or capacity is that certain entities may not have the legal capacity to enter into a swap agreement. A contract entered into without capacity can be deemed ultra vires and thus held to be unenforceable, which would permit the entity to avoid
its obligations on contracts with a negative value. Over half of all losses from counterparty defaults in the swap market to date arose from one such situation, a 1992 ruling by the British House of Lords that U.K. local government authorities did not have the capacity to enter into swaps. Swap market participants typically seek legal opinions and documentation concerning counterparties' capacity to engage in transactions. That did not help in the U.K case, where practitioners had opined that local governments, incidental to their ability to borrow, had the capacity to engage in swaps.

The capacity of local government units in the United States to engage in swaps is a matter of state law, and hence varies across the states. Some states, such as California, have statutes explicitly permitting governments' use of swaps and other derivative instruments, although since Orange County's financial debacle, proposals have been made to rescind that authority. In states without explicit authorization, the common-law analysis might well follow the House of Lords' reasoning. However, the narrower interpretation of the lower British court, that the use of swaps for hedging as opposed to speculation is incidental to the capacity to borrow, is the better approach from a public policy perspective. A prudent fiduciary should minimize the cost of public financing when it can be done with appropriately low risk. In the wake of recent losses on derivative investments, a few governmental entities have brought lawsuits raising ultra vires issues, but none as yet has been adjudicated. The legal capacity of

137. GROUP OF 30, supra note 24, at 51.
138. Hazell v. Hammersmith and Fulham London Borough Council, [1992] 2 App. Cas. 1, 37 (appeal taken from Q.B.). The House of Lords found that there was neither express nor implied authority for municipalities to enter into swaps under the statute from which local authorities derived their powers.
139. Id. at 29.
140. CAL. GOV'T CODE § 5903(c) (Deering 1994).
143. E.g., County Comm'r's v. Liberty Capital Mkts., No. DKO94-CV-2188 (D. Md. 1994). The Maryland case, proceeding against four brokers who did not settle, is for $7 million. That sum represents the amount not recovered from a settlement entered into with the other brokers of what was originally a $30 million loss from investments in structured notes and mortgage derivatives, when the statute authorized investment in short-term or U.S. government-backed securities only. See Betsy Pisnik, Charles County Survives Derivatives Fling: Official Broke Rules to Invest $31 Million, WASH. TIMES, Dec. 10, 1994, at D5. The presence of statutory authority to invest in derivatives may not negate the capacity question. Among the many potential issues raised by Orange County's losses is whether excessive speculation in derivatives is not only imprudent but also outside the statutory intent.
local governments to enter into swaps in other countries, such as Brazil, Canada, and Germany, is also uncertain.\textsuperscript{144}

The legal risk in insolvency involves the enforceability of close-out netting arrangements, a common provision in swap contracts to mitigate credit risk. When two parties have entered into more than one swap contract, a close-out netting arrangement nets the exposures on all of the transactions and terminates all of the contracts in one final payment upon triggering events, such as a counterparty's insolvency. If a bankruptcy trustee does not have to abide by the netting procedure and can follow the conventional insolvency rule of choosing which contracts of the debtor it will uphold, the trustee can "cherry pick" among the outstanding swaps and choose to enforce only those with a positive value to the insolvent firm. In addition, a bankruptcy filing stays payments to creditors and may require a creditor to repay funds paid out by the debtor during a specified period before the filing in which payouts are presumptively treated as a fraud on other creditors. Such bankruptcy code provisions prevent the debtor from paying a final close-out netting payment on a swap contract, and impeach the validity of a periodic payment under the swap contract made prior to an insolvency filing.

For U.S. counterparties, three pieces of congressional legislation—1990 amendments to the federal bankruptcy code,\textsuperscript{145} and 1989\textsuperscript{146} and 1991\textsuperscript{147} legislation dealing with banks and financial institutions—eliminated the difficulties in insolvency proceedings for swap agreements. These provisions created an exemption for swaps from the automatic stay and trustee termination rights in each of the relevant insolvency regimes and gave effect to netting provisions.\textsuperscript{148} The legal risks remain, however, in other jurisdictions where there is no explicit statutory protection comparable to that adopted by the United States.\textsuperscript{149} Swap dealers cite the enforceability of netting agreements as their greatest legal concern.\textsuperscript{150}

\begin{enumerate}
\item \textsuperscript{148} Enforceability Working Paper, supra note 144, at 54-55.
\item \textsuperscript{149} Id. at 55-58.
\item \textsuperscript{150} Id. The Subcommittee also suggests that certain relatively technical modifications to the relevant U.S. bankruptcy laws should be undertaken to guarantee swap enforceability, such as an expanded definition of swaps under the bankruptcy provisions. Id. at 60.
\end{enumerate}
C. Regulatory Regime

The dominance of banks in the swap market has resulted in swaps being exempted from regulation by the CFTC. Swaps, as customized contracts transacted off-exchange, do not resemble conventional futures contracts, and one would expect that the forward-future distinction defining the CFTC's regulatory authority would exclude swaps. Nevertheless, the absence of a statutory definition of either a forward or a futures contract always renders the legality of any off-exchange derivative contract open to question. In 1987 the CFTC indicated an intention, in an advance notice of proposed rulemaking, to review whether it should regulate commodity swaps.\textsuperscript{151} The agency implied that it might find such swaps to be unauthorized (non-exchange-traded) futures contracts, and it simultaneously launched an enforcement investigation into the Chase Manhattan Bank's dealer activities.\textsuperscript{152} Presumably it chose to investigate commodity swaps, rather than interest-rate and currency swaps, because the latter contracts are more directly related to the types of financial instruments specifically excluded from the CFTC's jurisdiction under the Treasury amendment.

The notice and investigation of Chase Manhattan's commodity swap activity produced serious consternation among swap market participants, and domestic commodity business ceased as all deals moved overseas.\textsuperscript{153} Because swaps are one of the areas of significant profitability for the largest money-center banks, and an important risk-management tool for hundreds of smaller banks, the CFTC action (even though limited to commodity swaps, which constitute a relatively small fraction of banks' swap business) was of concern to banking regulators as well as their constituent banks. In 1989, "bowing," as one commissioner put it, "to the firestorm of criticism precipitated by its enforcement action,"\textsuperscript{154} the CFTC reversed its position and issued a release detailing a safe harbor for most swaps from CEA regulation.\textsuperscript{155}

Additional problems may arise for currency swaps, concerning whether a judgment can be awarded in a currency other than the local currency. See, e.g., J. Trevor Brown, \textit{English Law and Swaps}, in \textit{The Handbook of Currency and Interest Rate Risk Management}, supra note 27, at 35-1, 35-13 to -20; Diane B. Wunnike \textit{et al.}, \textit{Corporate Financial Risk Management} 62-63 (1992).

\textsuperscript{151} CFTC Regulation of Hybrid and Related Instruments, 52 Fed. Reg. 47,022 (1987).

\textsuperscript{152} Id.


\textsuperscript{154} Id.

The CFTC's policy switch was insufficient to appease the banking industry, and the treatment of swaps was one of numerous issues that delayed the CFTC's 1989 reauthorization legislation until 1992. The 1991 Senate bill mandated exclusion of swaps from the CFTC's jurisdiction,156 largely in response to the lobbying efforts of banking regulators and swap market participants. Futures exchanges, fearful that they would lose business to an unregulated swap market, opposed the Senate's exclusion.157 They were successful in the Conference Committee, which adopted the alternative provision that the exchanges had supported in the 1991 House bill, giving the CFTC the authority to exempt transactions or classes of transactions from any or all provisions of the CEA, so long as the exempted transactions were between "appropriate persons" (institutions).158 The House version also contained a provision directing the CFTC to "promptly . . . exercise the exemptive authority" with respect to swaps.159 In a further gesture to the futures exchanges' concerns, the Conference Report instructed the CFTC to apply its new power in a "fair and even-handed manner to products and systems sponsored by exchanges and non-exchanges alike," and to "provide legal certainty to the existing OTC markets" without giving them "undue competitive advantages" and without commencing a "wide-scale deregulation of the futures markets."160

In January 1993 the CFTC exempted swaps between certain classes of investors, specified institutions and persons with assets over $10 million, from operation of all but the antifraud and manipulation provisions of the CEA, in a final order patterned after the Senate's mandatory provision.161 The exemption was qualified, requiring that the swaps not be standardized contracts, nor subject to a clearinghouse arrangement, and that the counterparties' creditworthiness be a material consideration in entering into the transaction.162 The conditions for qualifying swaps were intended to protect the competitiveness of futures exchanges, which had objected to the exemptive order, by preventing swaps with the essential characteristics of futures contracts from being unregulated, and therefore cheaper, than futures.

The futures exchanges subsequently sought an exemption from CFTC regulation for futures and options transactions conducted on

159. Id.
162. Id.
exchanges by professional and institutional traders, under the 1992 exemptive authority provision. The Commission agreed to only a limited exemption, proposing a three-year pilot program.\(^{163}\) Under the new program, certain transactions would be exempt from some CEA requirements, such as the requirement that trades occur on an exchange floor, while the investor protection and financial integrity provisions would continue to apply. The exchanges, dissatisfied with the outcome, recrafted their proposal more narrowly to mimic the swap exemption regarding participating investors and products, but there is no reason to believe that the agency will treat the revised proposal any more favorably.

As acknowledged in the CFTC's rule exempting swaps, issuance of the exemption does not settle whether swaps are futures contracts within the meaning of the CEA. Notwithstanding this acknowledgment, the CFTC brought an enforcement action against Bankers Trust Corporation of New York, a major swap dealer, for violating the antifraud provisions of the CEA in a series of leveraged interest rate swaps with Gibson Greetings, Inc.\(^{164}\) In order to hold the dealer liable, the Commission reasoned that Bankers Trust was acting as a commodity trading advisor (CTA) when it transacted with Gibson rather than a broker-dealer. This characterization was crucial because, unlike securities brokers, who must determine that a particular product is suitable for the customer before selling it, futures commission merchants are not subject to a general suitability requirement.\(^{165}\)

The Bankers Trust action is a disturbing exercise of agency jurisdiction, as interest rate swaps clearly are not futures contracts under existing precedent.\(^{166}\) Accordingly, it is difficult to see how Bankers Trust can be considered a CTA when the products in which it was dealing were neither commodity futures nor options. The CFTC was able to get away with such obvious overreaching because of damaging tapes indicating Bankers Trust employees had deliberately misled Gibson concerning the extent of its losses,\(^ {167}\) and the scandal-like atmosphere surrounding the case. Nevertheless, the case may not be an odd exception for exceptional factual circumstances to an otherwise

165. See Bieganek v. Wilson, 642 F. Supp. 768 (N.D. Ill. 1986). In fact, the CFTC order against Bankers Trust expressly stated that it made no finding concerning the suitability of the derivative transactions for Gibson. \textit{BT Securities Corp.} at *2 n.3.
166. \textit{See supra} notes 57-71 and accompanying text.
restrained regulatory policy seemingly suggested by the swap exemption rule. The former CFTC Chairman, Mary Schapiro, unlike her predecessor who promoted deregulation, aggressively expanded the agency's authority, seizing the opportunity to exert authority in the publicity surrounding sizeable investor losses, regardless of the jurisdictional fit.\textsuperscript{168} While the CFTC may think otherwise, swap counterparties do not need the CEA nor the CFTC to assert claims for breach or fraud in a swap transaction: such misconduct is clearly actionable under contract law and common-law fraud.\textsuperscript{169}

Although it is even less plausible to consider swaps to be securities than it is to identify them as futures contracts, the SEC has asserted its authority as well. In a jointly negotiated settlement with the aforementioned CFTC action, the SEC brought an enforcement action against Bankers Trust's swap subsidiary (a registered securities broker) for securities fraud in its dealings with Gibson, on the ground that options in interest rate swaps are securities.\textsuperscript{170}

The SEC's release does not provide any specific basis for this finding. Indeed, the release is internally incoherent. In particular, it notes SEC rules that exempt government securities, and options thereon, such as the embedded options in Gibson's contracts. Even without this exemption, swaps are not securities under the Supreme Court's jurisprudence. Among other criteria, the Court's interpretation of the definition of a security that is an investment contract requires that the parties participate in a common enterprise for profit, and exempts instruments subject to alternative schemes of federal regulation, such as products sold by banks.\textsuperscript{171} Moreover, as already discussed, in jurisdictional battles between the CFTC and the SEC, the courts have rejected the SEC's assertion of jurisdiction when an instrument has both commodity and security components. Although it is unlikely that the SEC's power grab will stand up in court, until a defendant appears who is unwilling to settle or the CFTC becomes more vigorous in maintaining its exclusive jurisdiction than it has been historically, the SEC will continue to seek to expand its reach over off-

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\textsuperscript{168.} See \textit{infra} notes 245-246 and accompanying text (discussing CFTC action taken against Metallgesellschaft). Other commentators share this view. \textit{See, e.g.}, Merton H. Miller & Christopher L. Culp, \textit{Rein in the CFTC}, \textit{Wall St. J.}, Aug. 17, 1995, at A10 (asserting that Congress needs to reign in the CFTC because the agency is exceeding its granted authority).

\textsuperscript{169.} See \textit{infra} note 172.


\textsuperscript{171.} \textit{See, e.g.}, SEC \textit{v.} Howey, 328 U.S. 293, 297 (1946); Marine Bank \textit{v.} Weaver, 455 U.S. 551, 555 n.3 (1982); Reves \textit{v.} Ernst & Young, 494 U.S. 56, 60 (1990).
exchange derivatives, an arena lacking futures exchanges to police the SEC's activity.

The exemption of swaps from CFTC jurisdiction leaves such products unregulated by the federal government. As straightforward contracts, swaps are simply governed by the law of the jurisdiction specified in the contract, typically, the State of New York or the United Kingdom. These jurisdictions are chosen because they are the locations of the major dealers and they have a relatively developed and stable body of commercial law. This does not, however, leave the market participants unregulated by the federal government. The major players in swaps are commercial banks, whose activities are heavily regulated by federal banking agencies. It should be noted that this is the same approach Congress took with respect to the foreign exchange market in the Treasury amendment.

Banking regulators use three principal tools of control: examinations, reporting requirements, and capital requirements. All banks are subject to an annual examination process, which for the largest banks is a continuous on-site examination. Among other items, the examination entails a review of a bank's practices and policies toward risk management and derivatives use. If an examiner believes that a bank's activities in derivatives are inadequately or imprudently understood or controlled, he can deem the activity an "unsound" banking practice and prohibit it. Bank examiner manuals and agency memoranda provide detailed instructions concerning appropriate procedures regarding derivatives. These include guidelines requiring senior management approval and oversight of derivative transactions, the segregation of functions so that individuals responsible for measuring risk exposure are independent of those who create the exposure, and the credit authorization staff's independence from trading personnel. Reporting requirements compel banks to provide infor-

172. Gibson Greetings did not need the federal securities laws or commodities laws for legal recourse against Bankers Trust, even though it pled such allegations in its civil complaint, as contract law and common-law fraud certainly applied (and were pendant claims in the federal case). After discovery of the tapes, the case settled with Bankers' Trust forgiving approximately $14 million (70%) of the $20.7 million Gibson owed under its contracts. Michael Quint, Gibson Suit on Trades Is Settled, N.Y. TIMES, Nov. 24, 1994, at D1.

173. A particular bank's regulator depends on the bank's corporate status. The Federal Reserve Board regulates state-chartered banks that are members of the Federal Reserve System, bank holding companies, and nonbank subsidiaries of bank holding companies. The Federal Deposit Insurance Corporation regulates state banks that are not members of the Federal Reserve System. The Office of the Comptroller of the Currency regulates national banks.

174. E.g., BOARD OF GOVERNORS, FEDERAL RESERVE SYS., SR 93-69, EXAMINING RISK MANAGEMENT AND INTERNAL CONTROLS FOR TRADING ACTIVITIES OF BANKING ORGANIZATIONS
Information regarding their total derivatives positions—measured by notional amount, product type, and total gross replacement cost—in their quarterly reports.

Regulators also require banks dealing in derivatives to inform customers if a product is unsuitable for them, and to keep a record of information provided to a customer who, after being so informed, insists on undertaking the transaction. In particular, the Office of the Comptroller of the Currency (OCC) requires banks dealing in derivatives to ensure that their sales and trading personnel "sufficiently understand derivatives" to be able to identify situations when a customer may not fully understand a transaction's risks. The agency further requires that a bank's credit officers understand the applicability of a particular transaction to the risks the customer is trying to manage. Where a bank believes a transaction may not be appropriate for a customer, but the customer wishes to proceed, regulations require the bank to document its analysis and the information provided to the customer.\(^{175}\) The OCC distinguishes this responsibility to assess the appropriateness of a transaction for a customer from the suitability requirements of securities dealers because unlike the dealer, the bank is not prohibited from carrying out the transaction, but simply must document that it informed the customer of the product's unsuitability.\(^{176}\) Of the estimated ten commercial banks that are swap dealers, six are supervised by the OCC.\(^{177}\)

In addition, banking regulators supplement their examination and reporting review of derivatives dealers with sanctions for misconduct. The Federal Reserve Board, in what is considered a severe disciplinary procedure, entered into a "written agreement" with Bankers Trust after the bank was sued by Gibson and other corporate customers who had experienced substantial losses on complex leveraged swaps, shortly before the CFTC and SEC settlements with the bank.\(^{178}\) The agreement required the bank to provide increased information


\(^{177}\) Id. at 422 (testimony of Eugene A. Ludwig, Comptroller of the Currency).

to specified swap customers, including daily valuation of contracts.\footnote{179} In all likelihood, the agreement will, in due course, become the standard for dealer conduct.

The third tool of banking regulators, capital requirements, is intended to guard against excessive risk-taking and thereby to protect federal deposit insurance funds, by ensuring that banks maintain adequate reserves.\footnote{180} Under the capital requirements, banks must meet a specified leverage ratio based on the ratio of a bank's core capital, which includes common stock, retained earnings, and perpetual preferred stock, to total assets. The required ratio is between three to four percent, depending on the bank's relative safety and soundness rating.\footnote{181}

Following an international agreement known as the 1988 Basle Accord, the product of negotiations through the Bank for International Settlements (BIS), U.S. banking regulators, along with their counterparts in other nations, implemented risk-based capital requirements, supplementing the leverage-ratio requirement, that include reserves for off-balance-sheet instruments, including swaps. This agreement came into full force in 1992.\footnote{182} Under the Basle capital requirements, banks must hold reserves based on the credit risk of their positions, that is, the risk of counterparty default.\footnote{183}

\footnote{179} The requirements pertain to "leveraged derivatives," whose payment formulas are leveraged such that results are dramatically magnified when interest rates shift. The agreement also required Bankers Trust to develop an oversight plan of personnel handling its leveraged derivatives business that ensures senior management is fully informed of the bank's exposure from such activity. \textit{Id.} at 7-8.


\footnote{181} See \textit{id.} at 285; see also infra note 183.

\footnote{182} \textit{MacEy \& Miller, supra} note 180, at 286.

\footnote{183} Bank capital is divided into two tiers. Tier one represents core capital, consisting of common stock, certain noncumulative preferred stock, and minority equity interests in subsidiaries. \textit{Id.} Tier two capital includes preferred stock not included in tier one, subordinated debt, loan, and lease loss allowances, and certain other hybrid capital instruments. \textit{Id.} Bank assets are sorted into four risk classes, which are assigned different risk weights (0, 20, 50, and 100%), and the bank must have capital equal to 8% of the risk-weighted sum of its assets. Because tier two capital may not exceed tier one capital, the requirement of an 8% capital-to-risk adjusted assets ratio also imposes a 4% tier one capital requirement. \textit{Id.} For derivative instruments, banks must hold the specified amount of capital (8%) against the risk-weighted "credit equivalent amount" of their over-the-counter derivative positions (swaps and swaptions). Futures contracts are not included in the risk-adjusted capital calculation (they are assigned a risk weight of 0%) because they are considered default-free due to the clearinghouse arrangement that guarantees counterparty performance. Credit equivalent amounts for swaps consist of two parts: (1) present exposure, which is measured by the marked-to-market value of the contract and is equal to the replacement cost were the counterparty to default on its obligations; and (2) potential future exposure, which is calculated by multiplying the contract's notional amount by a
Bank assets and liabilities are subject to additional types of risk besides credit risk. In late 1993, responding to a congressional directive that arose from concern that price risk is as important as credit risk for banks' financial condition, U.S. banking regulators proposed capital standards that incorporate interest rate risk. The proposal sought public comment on two alternative approaches: either a minimum charge on interest rate risk exposure above a threshold amount, or a risk-assessment method calling for a capital charge on a case-by-case basis. At the same time, the BIS proposed that market (price) risk be incorporated into capital standards. As with the existing capital requirements that incorporate credit risk, the proposed rules would apply to all bank investments and not solely to derivative instruments.

While there is substantial oversight of banks engaging in off-exchange derivative activity, not all swap dealers are banks, and nonbank dealers may not be subject to any regulation. If a broker-dealer who is registered with the SEC to sell securities, or a futures commission merchant who is registered with the CFTC to sell futures, were to deal in swaps, the activity would be subject to those agencies' respective regulatory regimes because the dealer is so regulated. However, securities firms that are active in swaps undertake their swap business in separately incorporated subsidiaries, and these entities need not be registered with the SEC because they are not trading regulated products (securities).

The principal reason for separate incorporation of a swap subsidiary is to obtain a AAA credit rating. The subsidiary is provided with sufficient capital, insulated from the parent for insolvency purposes, and required to minimize its risk by matching all of its swap transactions to obtain the highest credit rating. Securities firms devised this structure in order to compete with the better capitalized banks, which,

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factor from 0 to 5%, depending on the contract type (interest rate swaps have a lower weight than currency swaps, and contracts maturing in less than a year have a lower weight than those with more than one year to maturity). The credit equivalent amount derived from these two parts is then multiplied by a risk weight, ranging from 0 to 50%. The risk weight to be applied is dependent upon the creditworthiness of the counterparty. See Federal Reserve Board, Capital Adequacy Guidelines, 12 C.F.R. pt. 208 app. A, and 12 C.F.R. pt. 225 apps. A, B, reprinted in Bank Derivatives Activities Hearing-Part 2, supra note 174, at 785-847.

185. Id.
186. In order not to disrupt the swap market, simultaneous with its Bankers Trust action, the SEC issued an order exempting swap brokers and dealers from registration as securities broker-dealers, to the extent their instruments (options in swaps) were securities. SEC Release No. 34-35135 (Dec. 22, 1994).
unlike securities firms, have the highest credit ratings. A high credit rating is essential because, as has been emphasized, counterparty creditworthiness is a key market consideration.

There is, however, another reason for securities firms to use an unregistered affiliate for their swap business: avoiding the severe capital requirements the SEC imposes on derivative holdings. The SEC's capital requirements are intended to ensure that broker-dealers have sufficient liquid assets to satisfy obligations to customers and other broker-dealers and to provide a cushion against losses from market or credit risk. These rules were formulated prior to the development of the swap market and treat non-exchange-traded derivatives as unsecured receivables subject to a 100% capital charge. This is substantially higher than the risk-adjusted capital charge imposed on banks. Initially, the SEC rules did not create difficulties for broker-dealers because unsecured extension of credit was not a significant segment of their business. It is for swaps. In order to bring swap operations back inside the regulatory framework, the SEC has proposed a menu of changes to its capital requirements for derivative products. Some of the proposals would create requirements similar to those imposed by banking regulators on banks.

Although the SEC cannot control the operations of unregistered swap subsidiaries, it does obtain some information about the scope of their operation. Registered securities brokerage firms, the unregulated firms' parent corporations, are required to provide information about affiliates' activities that "are likely to have a material impact" on the broker's financial condition.\(^{187}\) They must also report on their systems for monitoring and controlling risks arising from affiliates' operations.\(^{188}\) The leading brokerage firms voluntarily agreed to provide position and risk model information to the SEC and to adopt internal controls for their unregistered affiliates.\(^{189}\)

A final category of swap dealer not subject to any federal regulation consists of insurance companies and their affiliates. While the largest players in swaps are international banks, followed by securities firm affiliates, a few large insurance companies have also created sepa-


\(^{188}\) 17 C.F.R. § 240.17h-2T.

rate entities to deal in swaps.\textsuperscript{190} Insurance companies are subject to state regulation in the states where they are domiciled or licensed to do business. State insurance departments, however, do not exercise control over affiliated firms not engaged in the insurance business, and as a result, such affiliates are not subject to capital requirements and their reporting requirements are minimal.\textsuperscript{191} They do, however, hold capital against their exposure,\textsuperscript{192} as would be expected in a market where creditworthiness is important.

The General Accounting Office recommended that the unregulated derivatives activity of the affiliates of insurance companies and securities firms be brought under the regulatory authority of the SEC.\textsuperscript{193} But while there is a good reason to ensure that bank involvement in risky instruments does not go unregulated—protection of the federal deposit insurance fund—this motivation does not apply to non-bank institutions.\textsuperscript{194} Furthermore, even for banks, there is no evidence that more regulation is needed to protect the deposit fund beyond existing capital requirements. A recent study of bank derivatives activities found a positive correlation between capitalization and derivatives usage, suggesting that current regulations sufficiently prevent moral hazard problems of undercapitalized banks engaging in more risky activities.\textsuperscript{195}

\section*{D. Uses of Swaps}

Swaps, like other derivative instruments, serve a risk-management function. Interest rate swaps are used to hedge interest rate risks, and currency swaps hedge foreign exchange rate risk. The example introduced of a commodity swap in which an oil company fixes the price it will receive for its product illustrates the hedging use of such swaps.\textsuperscript{196} Because futures contracts exist for the risks being swapped, a natural question is why use a swap instead? Typically, firms choose swaps over futures when customization of terms is important.

\begin{itemize}
\item \textsuperscript{190} The General Accounting Office identified three insurance companies that have sizeable over-the-counter derivative dealer affiliates. \textit{GAO Report, supra} note 11, at 87.
\item \textsuperscript{191} \textit{Id.} at 86.
\item \textsuperscript{192} \textit{Id.} at 91.
\item \textsuperscript{193} \textit{Id.} at 127. Although the CFTC would be the more natural regulator than the SEC, as swaps are closer to futures than to securities, the GAO views the CFTC as a lax regulator compared to the SEC.
\item \textsuperscript{196} See supra p. 52.
\end{itemize}
The most common distinguishing term is the contract length. Futures contracts have short duration, generally lasting for three to six months, and traded contracts rarely go out beyond a year. Moreover, contracts with the most extended expiration dates have far less liquidity. To hedge a long-term product commitment in the futures market, a trader has to engage in what is termed a rolling hedge. Under that strategy, a near-term futures contract is acquired and, as soon as it is about to expire, the position is closed out and a new contract is acquired with a later delivery date, thereby extending the hedge forward ad infinitum. This can be a risky strategy, creating, at the very least, liquidity risk. In one of the better known instances of financial difficulties caused by derivative trading, the German oil firm, Metallgesellschaft, A.G., found this out to its dismay.

In contrast to futures contracts, swap contracts can be written for as long a period as a counterparty desires. They are typically written for much longer periods than futures, ranging from two to fifteen years. While forward contracts also can be combined to replicate the longer term of swap contracts, as earlier noted, swaps are transactionally more efficient contracts.

Financial institutions, such as savings and loans, frequently have mismatched asset and liability durations. They lend at fixed rates for the long term (mortgages), but they borrow at floating rates over the short term (deposits). With this balance sheet structure, if short-term rates rise the institution will lose money. It can hedge the interest rate risk better with a swap than with a futures contract because futures contracts do not trade out far enough. The savings and loan takes a long swap position, paying a fixed rate, which it covers with the fixed rate it receives from the mortgagees. It receives floating-rate payments, which it uses to cover its floating liabilities to depositors. Financial institutions are, in fact, among the most frequent users of interest rate swaps.

197. The offsetting cash flows are likely to be mismatched in a rolling hedge. For example, if losses are incurred on the futures position, the firm will need to come up with cash to meet margin calls, while it might not yet have received the profits from its positive-valued longer term spot positions.

198. Culp & Hanke, supra note 14 (describing $1.35 billion loss sustained on futures contracts when firm could not meet margin calls and continue rolling hedge forward).

199. FABOZZI & MODIGLIANI, supra note 38, at 648.

200. Duration is a measure of a debt instrument's sensitivity to interest rate changes. Technically, it measures "how long, on average, the holder . . . waits before receiving cash payments" for small changes in the yield curve. HULL, supra note 44, at 99-100. In situations where all interest rates change by the same amount, the percentage change in a bond's price equals its duration, multiplied by the size of the shift in the yield curve. Id.
In a usage closely related to the hedging function, swaps can change a firm's asset or liability characteristics. A corporation that has borrowed funds at a floating rate can change its floating-rate obligation into fixed-rate debt by assuming a long swap position (fixed payer). The floating-rate payments it receives in the swap offset the floating interest it owes on the loan. Thus, its net payout is a fixed payment, the swap cash flows. The corporation has thereby changed the nature of its liabilities from floating- to fixed-rate obligations by entering into the swap. The use of a swap by a savings and loan institution to alleviate balance sheet duration mismatch is a liability swap.

Swaps can also be used to make adjustments on the asset side of the balance sheet. For example, insurance companies sell guaranteed investment contracts (GICs) to pension funds. These contracts commit the insurer to paying a fixed rate of return to the fund over several years. The insurers' investments, which must cover their GIC obligations, are typically made at floating rates. If the floating rate declines, the insurance company may not be able to cover its GIC obligation. It can protect against this risk by entering into a swap in which it pays floating and receives fixed rates. The fixed-rate payment is sufficient to cover its GIC obligations, while its investment earnings cover its floating swap payments. There will typically be a differential in payments made and received that enables the insurance company to lock in a specified spread, say 100 basis points, across the transactions.

The development of variants on plain vanilla swaps reflects the hedging and balance sheet management needs of participants. For example, forward swaps work like anticipatory hedges. Amortizing swaps better meet the requirements of counterparties matching mortgages or other financing projects with payment schedules that change as loans are prepaid. Swaps used in this fashion can be viewed as a mechanism by which banks can better serve customers. Many homeowners, for instance, prefer thirty-year, fixed-rate mortgages to adjustable-rate mortgages or shorter fifteen-year, fixed-rate loans. These preferred long-term instruments, however, impose a greater interest rate risk on banks than the short-term instruments. By entering into a swap, the bank transfers that risk to the swap counterparty, and is thus able to provide borrowers with the loan terms they desire. Amortizing swaps also have a regulatory avoidance purpose. The capital requirements for swaps are much lower than those for the underlying securities (calculated at .5% of the notional amount versus 50% of principal value). Hence, banks entering into such swaps can achieve, at a lower
capital cost, the returns from mortgage securities that they otherwise would have purchased.\footnote{Christopher James & Clifford Smith, The Use of Index Amortizing Swaps by Banc One, 7 J. APPLIED CORP. FIN. 54, 55-56 (Fall 1994). James and Smith contend that the regulatory benefit was well known and was the reason for these instruments' widespread use. \textit{Id.} at 58.}

The reconfiguration of liabilities through swap agreements suggests an explanation for swaps that was initially quite popular, but is now largely discredited, the quality spread differential (QSD), which is based on the concept of comparative advantage.\footnote{Larry D. Wall & John J. Pringle, Alternative Explanations of Interest Rate Swaps: A Theoretical and Empirical Analysis, 18 FIN. MGMT. 59, 60 (Summer 1989).} According to this explanation, high-quality firms are offered lower fixed rates for long-term borrowing than low-quality firms, because they present lenders with a lower risk of repayment default. In the floating-rate short-term borrowing market, although high-quality firms will still be offered better rates than low-quality ones, the differential is less because the risk of default is less (the duration of the loan is shorter, and refinancing is thus done at current rates or is not done at all). Hence, there are gains from trade to be shared. Low-quality firms borrow in the short-term floating-rate market, and high-quality firms borrow in the long-term fixed-rate market. They then enter into swaps that exchange payment streams, enabling the firms to borrow in the form they prefer, regardless of their comparative advantages, at a rate reduced by the amount of the QSD.

While the explanation is a familiar economic argument, it has fallen into disrepute in the swap context because it is premised on a persistent inefficiency in capital markets.\footnote{Some commentators maintain that QSDs are not arbitrageable, and hence the QSD benefit from a swap is illusory. \textit{Id.} Whether they are correct depends on the source of the QSD. \textit{Id.} For instance, if the source of the QSD has to do with default risk, then it is not arbitrageable. In other words, the higher QSD in the fixed-rate market evidences the view that the low-credit borrower's risk of bankruptcy increases over time. The long-term lender must take this risk into account at the start of its contract because the rate will not be adjusted later. The short-term creditor does not need to do so because it can adjust the interest rate over time for increases in default risk, and hence the QSD is lower in the short-term market. If the swap is done directly between the counterparties without a dealer, then the high-quality credit counterparty's interest savings is more apparent than real, because, in this scenario, the savings are compensation for the risk that the low-quality credit counterparty will default.} That is, once the swap market developed depth, arbitrage should eliminate credit-market differences. Although there is evidence, as arbitrage arguments predict, that QSDs have declined as swap usage has increased, the market for swaps has continued to expand despite the decrease in spreads.\footnote{James Bicksler & Andrew H. Chen, An Economic Analysis of Interest Rate Swaps, 41 J. FIN. 645, 649 (1986).}
Alternative explanations to the comparative-advantage thesis are based on the view that swaps lower financing costs. These arguments involve informational asymmetries, that managers know more about the firm than can be revealed to third parties. For example, where management believes its financial condition, and hence its credit quality, will improve beyond current ratings, a swap will let it hedge against interest rate risk while avoiding an "excessively" high fixed-rate quality-spread premium (that is, management speculates on its own QSD in the short-term market). At the same time, the swap may make it more difficult for management to increase the firm's risk at the expense of creditors, because by taking on short-term debt financing, incentives are reduced to shift risk after credit is extended.

As with other derivatives, swaps also can be used for investment purposes. Equity swaps, for instance, enable the purchaser to obtain the returns on an equity portfolio without having to undertake a direct investment in the securities. This is particularly attractive to U.S. investors when the swap is linked to the performance of a foreign equity index, such as the Nikkei-225 or Japan TOPIX. This is because the trading costs for foreign stocks are much higher than those for U.S. domestic shares, and the swap further avoids foreign exchange transactions.

V. MORTGAGE-BASED DERIVATIVES

Although swaps and over-the-counter options are the derivative instruments that have attracted the greatest attention from regulators fearing a possible financial catastrophe, some of the largest investor losses recently have involved mortgage-based securities and their derivatives. Given past experience—significant losses tend to attract legislative inquiries—these instruments can be expected to draw congressional attention, along with swaps and off-exchange options, in coming sessions. Thus, this Article briefly reviews mortgage-based derivatives, despite their absence from reformers' current focus.

An important innovation in the capital markets in the 1970s and 1980s was the securitization of residential mortgages. The develop-
ment of securitized mortgages countered a problem of disintermediation (shortfalls in funds available to depositary institutions to finance mortgage lending), which was due to the increase in inflation and interest rates in the late 1960s, in conjunction with federal ceilings on mortgage rates.210

In the simplest securitized (also termed structured) financing, residential mortgages are pooled and placed in a trust, and securities backed by the pool of loans are sold to investors. The securities, which represent shares in the trust, are referred to as "pass-through" securities because the interest and principal payments on the underlying mortgages are passed through to the investors who purchase the securities. They are also referred to as mortgage-backed securities (MBSs). Most pass-through securities are guaranteed by federal agencies, such as the Government National Mortgage Association (Ginnie Mae), the Federal Home Loan Mortgage Corporation (Freddie Mac), and the Federal National Mortgage Association (Fannie Mae). Congress created these agencies, whose mortgages constitute the securitized pools, to support an active secondary market in mortgages in order to reduce interest rates paid by homeowners.211

Mortgage instruments are unique among debt obligations because of a special option feature that provides homeowners the right to prepay mortgages without penalty. The prepayment option makes the maturity of mortgage securities uncertain. When interest rates drop, homeowners with fixed-rate mortgages refinance to take advantage of the lower rates. Investors in mortgages then find that they are paid off earlier than they expected, at exactly the time when it is least desirable, as they must reinvest at lower market rates. This is referred to as contraction risk. When interest rates rise, refinancing activity slows, and as fewer loans are paid off early, principal repayments are not accelerated. This occurs precisely when investors would want to receive their investment back in order to be able to reinvest at the higher market rates. This is referred to as extension risk. Pass-through securities therefore present substantial risk from the prepayment option, which decreases their value to investors.

An innovation in mortgage securities directed at reducing prepayment risk is the collateralized mortgage obligation (CMO). CMOs repackage the cash flows from a securitized mortgage pool into classes of interests with specified maturities. CMOs derive their cash flow from the underlying mortgages and therefore can be considered de-

210. See Fabozzi & Modigliani, supra note 38, at 568-69.
211. Id. at 570-71.
Derivative securities. They are not, however, derivative securities in the sense of forward, futures, or option contracts, which set prices today for future obligations but do not transfer any rights in the asset or its cash flows until the contract's expiration date. Derivatives are contracts to purchase assets or securities (or to provide a payoff based on an interest rate or stock index) in the future, whereas mortgage derivatives are themselves securities. Although their payoffs are indeed derived from another instrument, the underlying mortgage, CMOs are in fact an immediate transfer of rights to promised payments (the re-packaged mortgage's cash flows), and hence are in standard taxonomy a security rather than any generic derivative.

The standard CMO is divided into four classes or "tranches" of securities with different maturities. The first three tranches (A, B, and C) in a generic CMO receive periodic interest payments from the underlying mortgages, while scheduled principal payments and prepayments are applied sequentially. The payments are first used to retire tranche A, and after tranche A is retired in full, to retire tranche B, and so forth. The fourth tranche, the Z-bond, receives no payments of interest or principal until the other three tranches are paid off in full. Investors concerned about prepayment risk can purchase securities of the first three tranches and thereby better specify the maturity of their investment. A CMO does not, however, eliminate uncertainty; it merely redistributes it. The payoff uncertainty that has been reduced for the A, B, and C tranche investors has been shifted to the Z-bond holders, who therefore are subject to greater risk than a direct holder of the underlying mortgages.

The CMO structure serves two functions. In addition to redistributing repayment risk, it enables issuers to provide a wide range of maturities, of a short-term or intermediate length, compared to the term of the actual mortgages. This is accomplished through the tranches' different principal repayment priorities. Thus, the CMO structure expands the classes of investors interested in the instruments. For example, Z-bonds tend to be purchased by pension funds, life insurance companies, and other investors seeking to lengthen the duration of their asset portfolios so as to reduce reinvestment risk. The Z-bond's cash flow is well-suited to matching their long-term liabilities because it starts off as a zero coupon bond, paying nothing while the other tranches are being retired.212 Other investors, seeking greater security of payouts, are attracted to the A, B, and C tranches.

Some CMOs issue what are known as PAC or TAC bonds (planned and targeted amortization classes). These instruments are classes of bonds with specified schedules of retirement, similar to a bond sinking fund, that stabilize prepayment risk even further by providing fixed-range prepayment schedules that offer greater certainty regarding the security's cash flow pattern than standard CMO tranches. PACs are accompanied by non-PAC or companion bonds that, correspondingly, bear greater prepayment risk (analogous to the Z-bonds' position in a conventional CMO). If actual prepayments differ from the PAC bonds' prepayment schedule, the companion bonds must absorb the difference so that the PAC bonds' schedule is maintained. The companion bonds bear both the contraction and extension risk.

A further variation on the standard CMO is a floating-rate CMO, which includes a tranche that receives interest that varies with an index. To assure that the underlying collateral can meet the floating obligation, a cap is placed on the maximum interest that can be paid on the floating-rate class. Floating-rate CMOs are also typically accompanied by inverse-floater CMOs, securities that have coupon rates that move in the opposite direction of the index- or floating-rate bonds. If interest rates fall, the rate paid on an inverse floater increases. The CMO with a floating class and inverse floater is structured such that the two tranches' payouts offset each other to produce a fixed return that can be sustained by the underlying mortgages.

CMOs were immensely popular upon their introduction in 1986, and the market grew at a rapid clip from $48 billion in 1986 to $118.6 billion in 1990. Declining interest rates in the early 1990s made inverse floaters a very desirable product. As interest rates rose rapidly in 1994, investors in these instruments took substantial losses and the market for new issues dried up so substantially that it adversely affected the profitability of the major CMO dealers.

Stripped mortgage-backed securities (SMBSs), introduced by Fannie Mae in 1987, are another major development in securitized financing. SMBSs divide the cash flow of the underlying mortgages into unequal distributions of interest and principal components, interest-only securities (IOs), and principal-only securities (POs). As payments are made on the underlying mortgages, IO security holders receive the interest payments and PO security holders receive the

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213. Fabozzi & Modigliani, supra note 38, at 586.
principal payments. POs are issued at substantial discounts, and the yield that investors receive depends on the actual prepayment rate. Changes in interest rates affect IO and PO securities differently. For example, an IO investment will decrease in value when interest rates decline. As the underlying mortgages are paid off, the interest payments cease, as does the cash flow of the IO. A PO will decrease in value as interest rates rise. As prepayments cease, the PO's cash flow deteriorates and it takes a longer time to recover principal payments. IOs and POs are riskier investments than straight pass-through securities.

CMOs can be issued with IO and PO classes. These are called super IOs and super POs because of their substantial volatility. Holding both the IO and PO of an issue is not a perfect hedge. As some investors learned the hard way, although IO and PO securities move in opposite directions with changes in interest rates, they do not move symmetrically. Therefore, as with option-hedging, IO-PO portfolios have to be continuously adjusted.

CMOs and their many variants are not federally regulated. They are not subject to CFTC regulation because they are not futures contracts, and they are generally exempt from SEC regulation under the statutory exemption for securities issued or guaranteed by governmental entities and banks. It is somewhat inaccurate to view these product markets as free from federal oversight because banks are among the most active consumers of CMO products, and financial institutions' holding of MBSs is constrained by federal capital requirements and regulatory rulings.

For example, MBSs issued by Ginnie Mae have no risk weight, whereas Fannie Mae and Freddie Mac MBSs and agency-backed CMOs have a risk weight of 20%. SMBSs (IOs and POs) have 100% weights. As noted earlier, higher risk weight assets require banks to hold greater capital reserves than low-risk weight assets, discouraging banks from using them. Furthermore, high-risk CMO tranches, such as Z-bonds and inverse floaters, and SMBSs, are considered unsuitable securities for depositary institutions. They may be held only for specific, documented hedging purposes or if they meet certain stress tests based on the instrument's average life and price sensitivity under specified interest rate shifts. Banks must monitor such hedges and remove them if they are not working. These rules limit banks' holdings of the

215. See Charles A. Stone & Anne Zissu, The Risks of Mortgage Backed Securities and Their Derivatives, 7 J. APPLIED CORP. FIN. 99, 104-06 (Fall 1994). Investors who found that their IO or PO losses exceeded their PO or IO gains include the Louisiana Pension Fund and Glaxo Holdings. Id. at 104.
riskier MBSs. Many of the big losers in CMO investments were, in fact, not financial institutions, and thus were not similarly constrained. But as is true with the differential regulation of swap dealers, there is a distinct federal interest in banks, the federal deposit insurance fund, compared to other CMO end-users.

CMOs can be used for risk management. In particular, SMBSs are used to hedge portfolios of MBSs. Because stripped securities have much higher absolute effective durations than pass-throughs (that is, their prices are much more sensitive to interest rate changes), investors can reduce their mortgage portfolios' sensitivity to interest rates by establishing small positions in SMBSs. Financial institutions with balance sheet mismatches such that their asset duration exceeds their liability duration, can purchase IOs to reduce their interest rate exposure. The IOs will rise in value when interest rates rise and their assets' value decreases. Moreover, IOs have a negative duration, which shortens the duration of the combined portfolio. Thrifts and mortgage bankers use POs to hedge servicing portfolios (fees earned for servicing the mortgages underlying a pass-through structure have the same duration attributes as IOs). When interest rates decline and principal is paid down more quickly, servicing income decreases while the POs increase in value. In addition, SMBSs can be used to reduce a mortgage portfolio's prepayment risk because they react inversely to changes in prepayment rates. IOs counterbalance discount pass-through securities while POs counterbalance premium pass-throughs.

Finally, SMBSs are used to create synthetic pass-through securities with risk and return characteristics more desirable to investors than a simple pass-through instrument. For example, floating-rate CMOs are used by financial institutions and other investors seeking investments whose returns vary with the rate paid on their liabilities. Such CMOs have been structured to attract investors who otherwise would acquire another type of short-term, floating-rate investment.

216. SMBSs provide a better hedge than a Treasury security because cross-hedging involves basis risk.

217. Premium instruments, those with coupons higher than market rates, decrease in value as prepayments increase, while POs do not; whereas IOs balance the slow-down in prepayment rates for discount instruments, those with coupons lower than market rates. See Steven J. Carlson & Timothy D. Sears, Stripped Mortgage Pass-Throughs: New Tools for Investors, in HANDBOOK OF MORTGAGE-BACKED SECURITIES 553, 566-70 (Frank J. Fabozzi ed., rev. ed. 1988).
VI. STRUCTURED NOTES

Like mortgage-backed securities, structured notes are not truly derivatives. They are debt securities with derivative features; the debt's yield is pegged to the contingent value of another asset, rate, or index. Because of this dual nature, structured notes are often referred to as hybrid securities.

Structured notes were first introduced in 1990. The market has grown rapidly as institutional investors have sought mechanisms to increase returns in a period of declining yields. The notes are issued by high-quality credit institutions such as governmental entities, banks, and corporations, thus accounting for their desirable capital standard risk weights. The notes come in many varieties, most often as a customized issue sold entirely to one institutional investor. Generic varieties include:218 (1) inverse floating-rate notes, notes whose coupon increases as a specified interest rate decreases; (2) index amortizing notes, fixed-rate notes whose face declines prior to maturity depending on the level of a specified interest rate; (3) synthetic convertible notes, notes with low fixed-rate coupons and an option on the performance of an equity index or specific stock, such that the note pays a minimum par upon redemption plus an additional amount if the index or stock is above a specified level at maturity;219 (4) interest differential notes, notes with variable coupons and fixed redemption amounts or fixed coupons and varying principal, whose non-fixed components vary with the level of specified reference rates involving rate differentials across currencies or across maturities within one currency.220

The common feature of these diverse instruments is that investors preserve their capital by purchasing a debt instrument, but do not give up the possibility of upside returns because of the security's contingent return component. The high credit rating of the issuer ensures that principal will be repaid at maturity at the same time that the investor's return depends on the success of its bet on future interest rates, equity prices, or the spread between domestic and foreign interest rates. The structured note issuer hedges its contingent coupon

218. For a review of the various types of structured notes see Christopher J. Williams et al., Fixed Income Hybrid and Synthetic Securities, in THE HANDBOOK OF DERIVATIVES AND SYNTHETICS, supra note 40, at 179.

219. These notes are similar to convertible securities because the investor holds a fixed-income investment with the possibility of an additional upside return if the equity value rises above a certain level.

220. These notes create a yield-curve trade without exposure to currency risk. See Williams et al., supra note 218, at 179.
liability (the aforementioned upside return) by entering into a swap in which it receives a payment equal to what it must pay out on the note.

The futures or commodity-like component of structured notes could subject them to CFTC regulation, although their issuance by banks would appear to implicate the Treasury amendment. This is also true despite the notes’ securities (debt) characteristics, which otherwise place them within the SEC’s jurisdiction because, as previously discussed, courts hold the CFTC’s regulation is exclusive whenever an instrument has a futures-like feature.\(^{221}\) The CFTC, in fact, issued a tentative release proposing to regulate these instruments in 1987.\(^{222}\) This contributed to the jurisdictional battle across federal agencies previously noted in conjunction with the CFTC’s parallel effort to regulate commodity swaps.\(^{223}\) As a result, the 1992 legislation directed the CFTC to examine hybrids as well as swaps under its new exemptive power. The CFTC promptly did so, and established a fifty percent test for exclusion.\(^{224}\) Hybrids possessing a securities component of more than fifty percent of the instrument’s value, and therefore a futures component of less than fifty percent of the value, are exempted from CFTC regulation.\(^{225}\) This does not leave all such products unregulated. With the elimination of CEA exclusivity, the SEC can regulate the notes as securities. Most structured notes are exempted from SEC regulation by statute, however, because they are issued or guaranteed by governmental entities and banks.\(^{226}\)

It should be noted that the regulatory system governing securities is a very different regime from the derivatives regulation administered by the CFTC. Securities must be registered with the SEC before they can be publicly traded. But while the CFTC must approve new contracts under a public interest formulation for them to be traded,\(^{227}\) the SEC does not engage in a merit review of securities. The SEC must register the security as long as the selling material (the prospectus) meets its disclosure requirements.\(^{228}\) The governing regulatory

\(^{221}\) E.g., Chicago Mercantile Exch. v. SEC, 883 F.2d 537 (7th Cir. 1989).
\(^{223}\) See supra part IV.C.
\(^{225}\) Id.
\(^{228}\) 15 U.S.C. §§ 77f–77h.
principle is that "sunshine" is a "disinfectant." The view is that if a prospectus fully discloses the risks of an investment, investors will be adequately protected. They will not, for example, knowingly place their funds in an investment that is revealed to have extremely high risk or be subject to insiders' sharp dealing, or they will pay very little for the investment opportunity. As a consequence, seekers of capital will refrain from proposing such activities.

Despite the lack of a substantive statutory standard for the registration of securities, the SEC may take the position that it can prevent the trading of new derivative products, such as a hybrid security, that lack an economic purpose, through its authority to approve or deny rule changes of registered exchanges because proposals to trade new products, unlike the registration of conventional securities, are exchange rules. The former director of market regulation of the SEC suggested that a product serving "no hedging or other economic function," that is, a product used solely for speculation, would not meet the statutory standard for approving an exchange rule, that the rule be consistent with the purposes of the 1934 Act. His reasoning is that the benefits to market participants of such a product would be outweighed by the potential for manipulation, diminished public confidence in markets, and other regulatory concerns, and thus it is inconsistent with the Act's purposes. The extent to which the Commission adheres to this position and has kept products off the market for lack of an economic purpose is unknown.

Structured notes are typically used to enhance portfolio yields, that is, for speculation, rather than for risk management. Inverse floating-rate notes are purchased by investors with bullish views of fixed-income markets: they are popular in periods of low inflation and steep positive yield curves that reflect the market's expectation of rising rates. The investor expects rates to fall—his view is contrary to the market, for otherwise he could not profit from such an investment. Notes indexed to foreign interest rates and paid in U.S. dollars are sold to investors who are restricted from investing in foreign securities but have bullish views on foreign markets. Synthetic con-

229. Justice Brandeis, an ardent supporter of federal securities legislation, articulated the classic statement of the disclosure rationale: "Sunlight is said to be the best of disinfectants; electric light the most efficient policeman." LOUIS D. BRANDeIS, OTHER PEOPLE'S MONEY 62 (1914).
230. Becker & Burns, supra note 120, at 686 n.32.
231. Id.
232. Williams et al., supra note 218, at 180-81.
233. Id.
234. Id. at 190-92.
vertible and interest differential notes are attractive to investors with particular views on market movements. They find these customized vehicles preferable to futures contracts, as they can fine-tune their market bets in their own customized issue.

Index-amortizing notes can be compared to CMOs. They have shorter stated maturities and more well-defined amortization schedules, as they are based on specific interest rate movements rather than prepayment speeds. For example, such notes might mature in two years as long as LIBOR is below a specified rate, and extend beyond two years if LIBOR goes above that rate. CMO maturity dates, in contrast, depend on actual prepayment rates. Index-amortizing notes are most frequently issued by U.S. government agencies and are attractive to investors when the yield curve is steep, so that the options embedded in the note, altering maturity dates upon certain rates, are valuable compared to holding a straight note.

The speculative character of investments in structured notes becomes apparent when the investor's market view proves wrong. Orange County's investment fund purchased several sizeable structured note issues, and when its bet on a steep yield curve and declining short-term interest rates proved incorrect, it experienced severe portfolio losses and filed for bankruptcy.235 But the speculative character of the investment, the structured notes, was not the only problem. Orange County's financial difficulties were compounded by leverage. It borrowed heavily to follow its investment strategy and when interest rates turned against it, its losses were correspondingly magnified.236

Although structured notes have not been a focus of legislators' or regulators' concern, as interest rates rose in 1994 they became the source of fiscal problems for a number of financial institutions in addition to Orange County. These institutions acquired the notes because they had low-risk weights under the capital standards (the issuers of the notes had low credit risk). This made the notes desirable assets despite their significant market risk. The problem with structured notes in such cases is not the riskiness of the instruments per se, but the perverse incentives created by a regulatory regime focused on credit-risk-based capital standards. Evading capital standards

236. Id. Orange County used its structured notes as collateral for short-term borrowing to increase its investment in the notes. As the notes' value dropped, its lenders insisted on more collateral, and ultimately refused to roll over its loans, forcing the County into bankruptcy. See generally PHILIPPE JORION, BIG BETS GONE BAD, DERIVATIVES AND BANKRUPTCY IN ORANGE COUNTY 32-37 (1995).
was not, however, a factor in Orange County's bankruptcy filing due to losses on structured notes (it is not a bank subject to the capital requirements).

CONCLUSION

If this Article has accomplished its objective, the reader has acquired an appreciation of derivative securities and their institutional and regulatory environment. The most difficult aspect of derivative securities, the mathematical formulae by which they are priced, has not been introduced. This material was omitted because my goal is to aid the nonprofessional's thinking about regulatory policy, and not the choice of investments. Such decisions should be made with far greater economic information than that which can be provided in an introductory essay offering only an intuitive explanation of the economics of derivative instruments. The pricing of derivatives is, however, quite important. In fact, pricing misunderstandings may well be where many of the investors listed at this Article's outset have gone wrong. For example, Procter & Gamble alleged in its lawsuit against its derivatives dealer, Bankers Trust, that the dealer calculated an option in a swap contract concerning the interest rate it would pay in a method different from what Procter & Gamble was told at the outset.237 This made the swap value decidedly negative, unbeknownst to the corporation. In addition, David Askin's hedge fund's bankruptcy has been attributed, in part, to his incorrect valuation of the fund's risky CMO investments.238

The question of the transparency of the pricing of off-exchange derivatives suggests that the regulatory philosophy underlying the securities law, full disclosure, may have an important role to play in the derivatives context. The level of disclosure concerning derivative holdings of SEC registrants is a very live topic of regulatory discussion, as the SEC is proposing more detailed disclosure to be in place for 1996 financial reports.239 The recent losses sustained by certain corporations and mutual funds could not have been anticipated by investors under the present minimal disclosure requirements. Given the varied forms and uses of derivatives that this Article has summarized, revising that policy is surely merited. Nevertheless, any disclosure changes the SEC makes would be an incomplete solution because the

238. Did Dealers Gang Up on David Askin?, supra note 1, at 84.
Commission lacks regulatory authority over many market participants. 240

Although a common reaction to the highly publicized derivatives losses is to demand increased regulation beyond enhanced disclosure, there is no evidence that the present regulatory arrangements detailed in this Article contributed substantially to those losses. More significant contributory factors have been the investors' own poor internal controls, or greed, which transformed a successful hedging or moderately risky investment strategy into one of high-risk speculation. For example, the trader responsible for the demise of Barings was in charge of his branch's trading and back-office operations, and was not subject to any position limits. 241 These policies are counter to standard good management practices that segregate personnel oversight, bookkeeping, and trading functions and limit each individual trader's, as well as the entire firm's, exposure. 242 Of course, by ascribing losses to poor management I do not mean to suggest that there are no sympathetic victims, such as students of Odessa College or shareholders of Gibson Greetings, over whose plight the government might validly be concerned.

But in considering what a regulatory system can or should do concerning spectacular and sudden investor losses, we must remember that issue-framing is a key component of the policy process. Witnesses recounting their financial horror stories, such as the small

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240. For instance, the SEC regulates municipalities' securities issuance only indirectly, through its authority over municipal securities underwriters and broker-dealers. It requires underwriters of municipal issues over $1 million to obtain, review, and distribute to investors, disclosure documents from issuers, but imposes no substantive requirements on those documents because it has no authority to do so. See Rule 15c2-12, Exchange Act Release No. 34-26985, 1989 SEC LEXIS 1173, at *1 (June 28, 1989). In addition, in 1994 the SEC prohibited brokers, dealers, and municipal securities dealers from underwriting municipal securities where the issuer does not commit to provide ongoing disclosure of annual financial information and material events, and from recommending municipal securities where the broker-dealer does not have in place procedures to obtain material event notices from the issuer. Municipal Securities Disclosure, Exchange Act Release No. 34-34961, 59 Fed. Reg. 59,590, 1994 SEC LEXIS 3508, at *1 (Nov. 10, 1994) (to be codified at 17 C.F.R. pt. 240). Again, given the nature of the SEC's authority, the regulation is indirect. The rule does not, for example, specify the requisite content of the financial information that must be continuously disclosed and simply requires that the information in the continuing disclosure correspond to whatever information was provided in the municipality's final official statement for the issue.


242. See, e.g., Working Paper of the Systems, Operations and Controls Subcommittee, in GROUP OF 30, supra note 24, at 66-71 (appropriate internal controls for swap market participants); BANKING CIRCULAR, supra note 175, at 19-20, reprinted in Bank Derivatives Activities Hearing-Part 1, supra note 175, at 703-04 (appropriate internal controls for banks).
college or school district that lost everything when an entire endowment was imprudently placed in a risky CMO investment, typically take precedence in policymakers' deliberations over the testimony of investors who have benefitted from reduced operating costs by hedging price risk through derivatives, such as McDonald's savings of 10 to 150 basis points from interest and currency swaps.\textsuperscript{243} This is because public opinion will fixate upon the more vivid event.

Improved internal management controls, rather than improved disclosure, for end-users, is, in short, the more crucial protective mechanism because informed insiders will be able to act more quickly to prevent losses than informed outsiders. Corporate governance is not, however, an issue within the regulatory authority of the SEC\textsuperscript{244} or CFTC (apart from the investment companies and broker-dealers who must register with these agencies to do business) nor should it be. The CFTC, in fact, has asserted authority over end-users through the backdoor. It brought an action against a subsidiary of Metallgesellschaft contending that the long-term heating contracts it sold customers were illegal futures contracts because the contracts were neither registered nor traded on a designated exchange.\textsuperscript{245} The Commission's objective was not to protect the contract purchasers, as is its statutory mandate, but rather to impose risk-management practices on the parent multinational corporation that was not otherwise within its jurisdiction.\textsuperscript{246} My view is that the CFTC action was misguided. The appropriate locus for good-practices guides are trade or industry organizations, such as the Group of 30, rather than federal agencies, which are not well positioned to know what is the best practice for a specific entity. Industry and trade organizations are better attuned to the latest transactions and technologies for evaluating risk. In addition, corporate governance standards are best left to the institutions of state

\textsuperscript{243} Bank Derivatives Activities Hearing-Part 1, supra note 175, at 630-34 (letter from Carleton D. Pearl, Treasurer, McDonald's Corp.).

\textsuperscript{244} See Business Roundtable v. SEC, 905 F.2d 406 (D.C. Cir. 1990) (striking down rule imposing exchange-listing requirement of one-share, one-vote, as exceeding SEC's authority).

\textsuperscript{245} In re MG Ref. & Mktg., Inc., No. 95-14, 1995 WL 447455 (Commodity Futures Trading Comm'n July 27, 1995).

\textsuperscript{246} See id.; Jeffrey Tayor, CFTC Levies Fines Against German Firm, WALL ST. J., July 28, 1995, at C1 ("[T]he most important point is the focus on the lack of internal controls throughout the organization . . . . We hope this will teach multinational corporations that they must have adequate internal controls." (quoting then CFTC Chairman Mary Schapiro)); Schapiro Stresses Internal Controls in Wake of Fallouts from Derivatives, 27 Sec. Reg. & L. Rep. (BNA) 1947 (Aug. 11, 1995) ("To argue that the MG message "concerns off-exchange activity" ... completely misses the point... . Rather, MG is an 'internal controls' case, first and foremost." (quoting then CFTC Chairman, Mary Schapiro)).
corporate law, which have a far better track record than the federal government in shareholder protection. 247

Most of the attention in recent policy debates has been on extending regulation into the unregulated swap market, although the sizeable losses of Barings and Metallgesellschaft in regulated futures markets may alter that focus. The institutional features of this market, reviewed in this Article, have certain investor safeguards that, ironically, might be dissipated by greater regulation. For example, the absence of a clearinghouse in the off-exchange market provides market participants with strong incentives to check counterparty creditworthiness, and thereby develop internal expertise on derivatives. Such inquiries would be less forcefully undertaken if the market were regulated. This is especially true if a clearinghouse system were required, as the SEC has advocated. 248 It would also open up the market to even less sophisticated investors than the institutions that have, at least as alleged in their lawsuits, turned out to be far more naive than their resources otherwise suggested. 249 Less sophisticated dealers would enter as well, because the less well-capitalized firms kept out of the current market would benefit from a clearinghouse guarantee.

There is a real question whether some of the eligible participants, particularly governmental entities, are truly competent to play in the game. 250 Rather than restrict their participation in these markets, 251 or turn dealers into insurers through expanding suitability rules-strategies that would raise derivatives’ costs to competent as well as incompetent investors—I would focus on improving the investment

249. For example, as mandated by Congress, the CFTC’s exemption for swaps pertains only to “appropriate” investors, consisting of classes of institutional investors considered to be sophisticated. CFTC Exemption of Swap Agreements, 17 C.F.R. pt. 35 (1995). This restriction would no longer exist were the swap market to come under CFTC regulation.
250. See, e.g., West Virginia v. Morgan Stanley & Co., 459 S.E.2d 906, 909 (W. Va. 1995) (noting that State’s losses on government securities were caused in part by inexperienced staff); Ruth Simon, Why Your Town Could Get Stung Like Orange County, MONEY, Feb. 1, 1995, at 20 (asserting that government entities’ investment staffs are typically ill-trained, overworked, and operating under inadequate oversight).
251. Prohibiting government entities from participating in the derivative market would be politically difficult. The futures exchanges’ effort to obtain an exemption for professional trading analogous to the swap exemption, see supra text accompanying note 163, was opposed by the Government Finance Officers Association, which, as a corollary, did not want to be excluded from any markets and “called any attempts by ‘federal regulators to direct state or local investment policies an inappropriate intrusion’ on the state function.” CBT Asks CFTC to Consider a Modified ‘Promarket’ Petition, 26 Sec. Reg. & L. Rep. (BNA) 1721, 1722 (Dec. 23, 1994).
decision-making capacity and internal controls of these entities. This could be accomplished by having trade associations, such as the Government Finance Officers Association, develop guidelines of good practices, including the hiring of investment managers or consultants with adequate expertise to evaluate proposed strategies and the calculation of the market value of derivative holdings on a frequent periodic basis. Periodic revaluation would, for instance, enable supervisors to identify problem investments early on and prevent staff, in the hope that the market will reverse course, from building up huge loss cumulations, as occurred in the Orange County fiasco. Improved internal controls are, of course, not substitutes for informed and competent personnel. To the extent local governments cannot employ adequately trained investment personnel, restricted investment choices or suitability standards may be necessary. But such strategies will greatly increase municipalities' expenses as either they will be unable to hedge interest rate risk effectively or they will be charged higher prices by broker-dealers fearing liability.

As this Article has indicated, many derivative instruments are federally regulated, although the overall regulatory scheme is haphazard and dispersed across several regulators. Regulatory fragmentation is not inherently a problem. It may well have contributed to the impressive innovation in U.S. derivative product markets over the past decades. Moreover, the core uses of derivative instruments, detailed in this Article, to achieve risk-management objectives, are sharply distinct from those of securities, which are issued for capital formation purposes. Consequently, merging the regulatory regimes, as some have recommended, would not appreciably facilitate regulation. For example, separate staffs specializing in the different markets would be necessary. This is frequently the case in countries where there is only one agency regulating securities and futures.

As former CFTC Chairman Philip Johnson pointed out, the regulator of an unpopular industry itself becomes unpopular. That truism, no doubt, contributes to the recurring proposals to absorb the CFTC into the SEC because its clientele, speculators, have never risen

255. Johnson, supra note 117, at 119.
256. Id.
to heroic status in the public imagination. Readers of this Article, it is hoped, will overcome the tendency to let the opacity of derivatives and the intimate connection between derivative markets and speculators carry the day in arguments over regulatory policy, and will instead require reform proposals to be grounded in sound policy considerations.