

Managing Risk in the '90s: What Should You Be Asking about Derivatives?

“**D**erivatives” has become a code word for anything financial that bites you when you least expect it. Everyone has read recent accounts where use of derivatives has contributed to bankruptcies or major financial losses to municipalities, counties, corporations, or banks. However, as is usually the case with reports of monumental events, the focus has been only on the negative. Derivatives also represent more efficient ways of doing what can already be done with more basic instruments, to hedge or arbitrage risks that exist naturally in any business operation. Derivatives are the fastest-growing financial instruments of our time. When used strategically, they can be very effective tools to mitigate risks. When used to speculate, that is, to bet on the inefficiency of financial markets, they can be trouble, especially if you are unaware that you are betting.

On April 28, 1995 the Federal Reserve Bank of Boston held an educational forum entitled “Managing Risk in the '90s: What Should You Be Asking about Derivatives?” The daylong forum, presented by experts from nonfinancial corporations, investment and commercial banks, pension funds, issuers of securities, academics, lawmakers, and government regulators, discussed important issues in the management of risk. The speakers outlined a conceptual framework for analysis of derivatives and suggested risk management guidelines for successful use of derivatives. This article is based on the presentations and discussions at that forum.

The first section describes derivatives and their uses. It outlines their origin and their history, and the reasons why they are the fastest-growing financial instruments today. Section II provides practical examples of how derivatives have been used to hedge risk or to increase returns, along with some guidance about avoiding their pitfalls. It includes examples of hedging from the perspective of a financial institution, a corporate treasury, and a state government, as well as an example of arbitrage, from an investment manager.

The third section deals with structured notes, which achieved some

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President and Chief Executive Officer, and Economist, respectively, Federal Reserve Bank of Boston. The authors are grateful to all the participants in the forum; their names are listed on page 25.

notoriety because they were implicated in the Orange County debacle; the thrust of this section is determining when structured notes and mortgage-backed securities are appropriate investments. These securities offer unparalleled flexibility, but their risks are often poorly understood. Section IV provides practical guidelines as to the elements of a risk management program, discusses the disclosures required for accounting purposes, and describes the legal liabilities that arise when derivatives lead to losses.

The fifth section focuses on the implications of the growth in derivatives for regulators and for the industry itself. Two distinct concerns emerged: first, ensuring that investors are protected by either regulation or the quality of the counterparty relationship, or both, and second, maintaining the stability of the financial system. Six major securities firms have developed a voluntary set of standards and practices in the areas of management controls, evaluation of capital to risk, regulatory reporting, and counterparty relationships. In another effort, major securities and foreign exchange trade associations have developed a voluntary code of conduct for wholesale over-the-counter market transactions that focuses on the counterparty relationship. On the regulatory side, much has been done to reduce the potential for systemic risk in the use of derivatives. However, congressional leaders are not convinced the voluntary approach used by the industry is sufficient, and legislation has been introduced to increase regulatory oversight and control derivatives sales practices. Whether this is necessary is the issue.

Investors can take steps to clarify their understanding of derivatives, and dealers can make the nature of counterparty relationships more evident. Moreover, the markets have proved quite resilient to recent crises involving derivatives, and a persuasive argument can be made that derivatives actually reduce the likelihood of a crisis, by facilitating risk-sharing in a more complex world. The most serious of recent problems have not involved exotic derivatives but rather mundane instruments. It was the all-too-human tendency to "bet the ranch" that was responsible for these problems as much as the instruments themselves. Restricting the use of derivatives through regulation could be counterproductive, but market participants must exercise self-discipline and restraint.

Cathy Minehan concluded the forum by posing 10 questions that should be asked by any prospective end users of derivatives. These questions focus on three basic areas in controlling derivatives activities: investment strategy, relationships with counterpar-

ties, and the internal risk management process. Unless users can answer "yes" to all the questions, they should not be using derivatives.

- In the area of investment strategy, do I have a written investment strategy that has been approved by the relevant governing authority and conforms to the laws and regulations that affect the kind of investments I can make?
- Do I have internal and external monitoring mechanisms independent and sophisticated enough to spot deviations from my investment strategy that I may be unaware of, and tell me about them?
- In the area of counterparty relationships, do I have a way of assessing the credit risk associated with my counterparty?
- Have I given my written investment strategy to my counterparties, be they brokers, dealers, or banks from whom I am purchasing a derivative? Have they acknowledged the unique aspects, if any, of my strategy and understood the legal, regulatory, and other constraints involved?
- If I rely on my counterparties for investment advice, have I informed them of this and received acknowledgment, as well as an explanation of how conflicts of interest will be avoided?
- In the internal risk control process, do I have written limits on the market and credit risk I am willing to bear?
- Do I have systems at my disposal, whether internally or through my counterparty, for monitoring, valuing, and stress-testing my positions?
- If valuations are done by my counterparties, can I verify them independently?
- Is the staff responsible for managing and overseeing my positions trained to evaluate the risks inherent in my portfolio and to monitor those who manage my investments?
- Are these oversight personnel independent and able to overrule those doing the investing, if necessary?

I. The Use of Derivatives

*Jay Light, Professor of Finance,
Harvard Business School*

Derivatives are not new. They were actively traded in 1670 in Amsterdam, at the time one of the dominant world markets for securities and commodities. There, the vast majority of trading was done through derivatives, particularly forward contracts.

What Are Derivatives?

Derivative instruments can be defined as financial contracts whose value is derived from the value of other assets, interest or exchange rates, indexes, or financial contracts.

The value of derivative instruments is often linked to prices of traded securities. For example, a stock option is a derivative security whose value depends on the price of a stock.

The term derivative is also used to refer to a variety of debt securities, sometimes called structured securities, that have derivative characteristics or embedded options. For example, some bonds contain call and put options. A callable bond allows the issuer to buy back the bond at a predetermined price at certain times in the future. Conversely, a puttable bond allows the holder to demand early redemption at a predetermined price at certain times in the future.

Many familiar financial instruments have embedded derivatives. For instance, prepayment privileges on fixed rate mortgages are equivalent to the call option on a bond, while early redemption privileges on fixed rate deposits are equivalent to the put option.

Derivatives can be categorized according to several characteristics. First, they can be classified on the basis of the underlying asset, index, or rate of exchange to which they are linked. Second, derivatives also can be classified as either a forward contract or an option contract (or a combination of the two). A forward contract is an agreement to buy or sell a security at a future date at a price determined at the time of the contract. In contrast, an option contract confers the right, but not the obligation, to purchase or sell a security at some future date at a predetermined price.

A distinction can be made between derivatives traded on an exchange and those traded over the counter. Over-the-counter contracts are usually between two financial institutions or between a financial institution and its corporate customer and are often individually tailored to the customer's requirements. In contrast, standardized derivatives are traded on exchanges (where forward contracts are known as futures). As the two parties to the contract do not necessarily know each other, the exchange itself guarantees that the contract will be honored.

The original purpose of these instruments was to facilitate trading when time lags were involved in the transaction. The payments system in Amsterdam in the seventeenth century was slow and cumbersome, and forward contracts allowed traders to reduce costs.

Modern use of financial derivatives in the United States can be traced to the GNMA futures contract, which began trading in the 1970s. This futures contract was developed by financial institutions as the increased volatility of interest rates made the holding of mortgages more risky. Today, derivatives are used for three reasons: to reduce risk, to change the nature of one's financial exposure, and to reduce transaction costs. Economists tend to define derivatives as tools for risk management. Dealers tend to think of derivatives as a way of making a spread. And some CEOs of asset management firms think of derivatives as a way of making some risk-adjusted arbitrage profits.

Derivatives are the fastest-growing financial instrument of our time, as measured either by the rate of growth of new contracts or by the amount of existing contracts. The volume of futures trading on any given day is several times the volume of trading on the New York Stock Exchange. The volume of

Derivatives are used today for three reasons: to reduce risk, to change the nature of one's financial exposure, and to reduce transaction costs.

over-the-counter derivatives such as swaps has also increased dramatically. According to the most recent annual survey conducted by the International Swaps and Derivatives Association, the notional amount outstanding of interest rate swaps has reached almost \$9 trillion, and of currency swaps \$1 trillion. Caps, floors, and collars total a little over \$1 trillion.

In a sense, derivatives markets are now the "tail that wags the dog" of the underlying securities markets. Much of the price discovery, that is, discovery of future securities prices by traders and investors from the current market data, now occurs in derivative markets, and in this way derivatives trading influences the price of the underlying securities. It is worth noting, however, that the large notional amounts

Eleven Ways to Buy the S&P 500 Index

Professor Light listed 11 ways to buy the S&P 500 stock index:

Purchase every one of the 500 stocks in the index;

Buy one of a number of futures contracts trading on the S&P 500;

Negotiate a forward contract on the index with a private intermediary, such as an investment bank;

Buy a call option on the S&P 500, which would allow one to capture the capital gains on the S&P 500, should prices rise;

Buy the 500 stocks in the index and buy a put option, yielding the same result as buying a call option, namely, ensuring against a drop in the price of the index while allowing one to benefit from a rise in its price;

Buy a bond convertible into the S&P 500 at face value;

Buy from a Wall Street dealer a structured note with an interest rate tied to the return on the S&P 500;

Buy from a bank an equity-linked Certificate of Deposit that would pay a guaranteed minimum rate, but if the S&P 500 increased over a certain level, the interest rate would be tied to that increase;

Buy a Guaranteed Investment Contract with the same linkage from a life insurance company;

Enter into an equity swap where one would pay a floating interest rate (usually London Interbank Offer Rate, known as LIBOR) and receive the rate of return on the S&P 500; or

Buy a unit investment trust that holds the S&P 500; an example is a SPDR, traded on the American Stock Exchange.

Professor Light noted that all these are contracts that could be used domestically. Another whole set of functionally equivalent contracts could be entered into from London or Tokyo or other financial centers.

involved in derivatives trading often overstate their importance. In derivatives trading, one often takes two offsetting positions that are nominally very large,

but what really matters is the difference between them, which is usually relatively small.

The Many Forms of Derivatives

A great variety of derivatives exist today, many very close substitutes for each other in the sense that they are designed to accomplish the same economic goal. This should be kept in mind when discussing proposals to regulate derivative activities. The implications of this for regulatory structure are profound, both for the way money is managed and for the regulatory process by which the government supervises relationships among intermediaries and between intermediaries and final customers.

Why so many ways to accomplish the same thing? In a perfect world, with no trading costs, no transaction costs, no taxes, and no regulations, where everyone could borrow at the same riskless interest rate, these contracts would be completely redundant

Derivatives exist because in the real world there are trading costs, limitations on borrowing, margin requirements, taxes, and regulatory constraints.

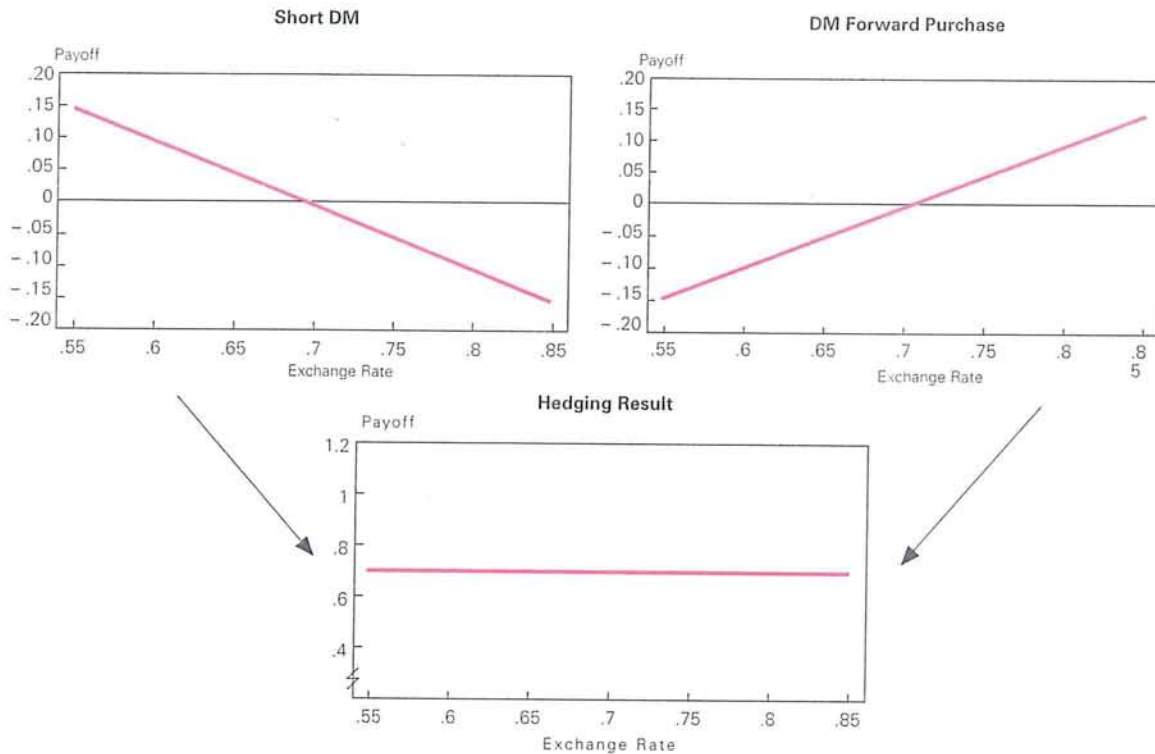
and they would not exist. They do exist precisely because in the real world there are trading costs, limitations on borrowing, margin requirements, taxes, and regulatory constraints. From the vantage point of users, derivatives are a way to minimize transaction costs, taxes, or limitations on borrowing; but from a regulator's perspective, derivatives can sometimes be seen as a way to circumvent constraints on the transactions that particular types of institutions are allowed to undertake. Derivatives are more mundane than people often imagine. They allow people to accomplish the same transactions as in the cash market, only more cheaply and more effectively.

The Value of Derivatives

From the point of view of individual market participants, derivatives provide a number of benefits such as opportunities for cost reduction, lower trans-

Figure 1

Purchasing a DM Forward



action costs, and lower taxes. Derivatives allow fast and easy execution while limiting credit risk and allowing firms to obtain financing at a lower cost. From the systemic point of view, derivatives provide for more effective sharing of risk. When derivatives can be traded more economically than other instruments, they allow the process of price discovery to take place much more quickly, leading to fairer and better prices.

II. Effective Derivatives Strategies

Hedging Foreign Exchange Risk at Gillette

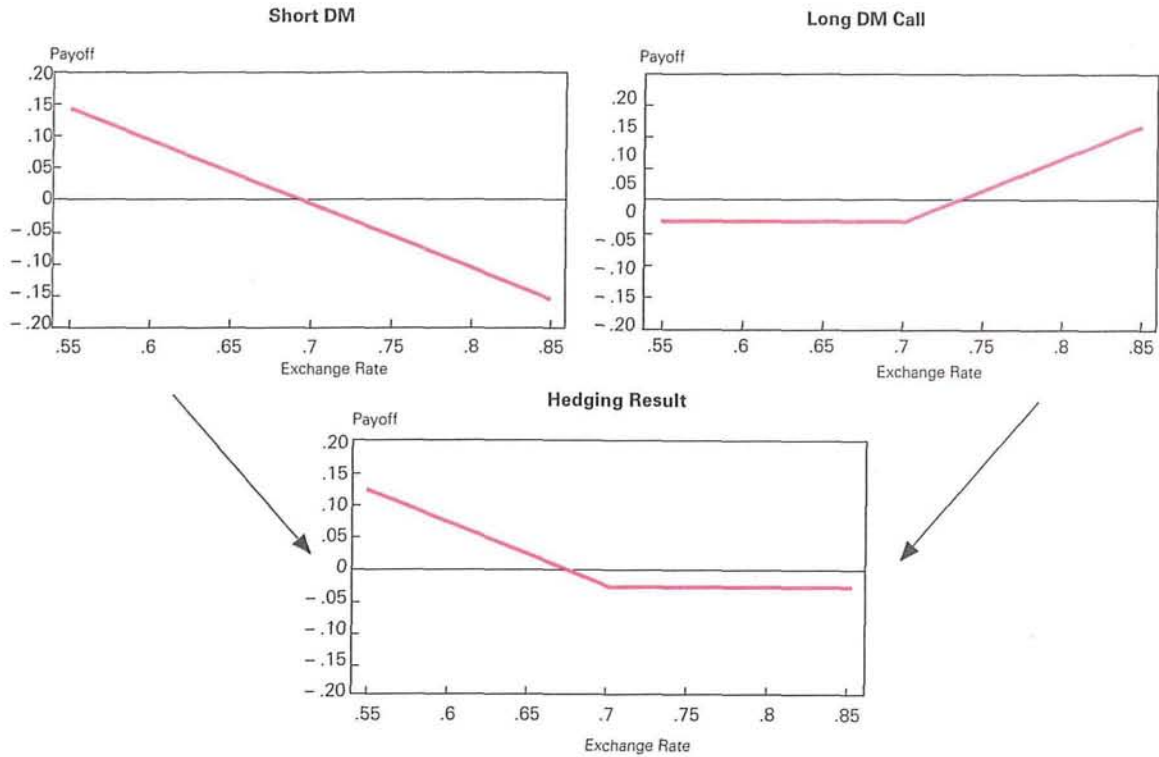
Gian Camuzzi, Senior Assistant Treasurer,
The Gillette Company

When a U.S. company buys German equipment, with a fixed price that must be paid in deutsche marks in six months, the company faces a significant foreign

exchange risk. If the mark depreciates relative to the dollar, the firm will pay a lower cost for its equipment in dollar terms and so will have a gain. But if the mark appreciates, the cost of the machine will be higher and the firm will experience a loss.

The firm can hedge, or lock in, the price of equipment in dollar terms either by using basic cash instruments or by using a derivative. To use cash instruments, the firm would purchase the needed marks at the spot or current rate, deposit them for six months, and at the same time borrow the U.S. dollar-equivalent. Alternatively, the firm can hedge its exposure by entering into a forward contract to buy the marks in six months at an exchange rate agreed upon today, say 0.7 dollars to the mark. The effect is to lock in the exchange rate for the mark that the firm requires. The results of hedging with a forward contract are depicted in Figure 1. The first diagram shows the firm's unhedged position. The effect of the forward purchase alone is depicted in the second diagram. The third diagram shows the combination of the two—the

Purchasing a DM Call



firm is now completely insulated from the movements of the dollar-mark exchange rate. Entering a forward contract requires no initial payment. Since the firm does not need to borrow the U.S. dollar amount, it has a cleaner balance sheet. In addition, it faces no investment risk from keeping marks on deposit and can frequently achieve a better exchange rate.

As an alternative to a forward contract, the company could buy a call option to purchase the needed amount of marks at a certain exchange rate six months from now. If six months from today the actual exchange rate turns out to be greater, the company exercises the option and buys the marks it requires at the agreed-upon exchange rate. If the actual exchange rate is below the exercise price of the option, the firm does not exercise the option but instead buys marks on the market in the usual way. The option alternative allows the firm to insure itself against a higher exchange rate while still benefiting from the lower exchange rate. This is depicted in the three diagrams in Figure 2. The first again shows the firm's

unhedged position. The second shows the effect of buying a call option alone. The third diagram shows the combined result. The firm can still benefit from a favorable movement of the exchange rate but is insulated from a possible loss from an unfavorable movement. Of course, this insurance comes at a price. While entering a forward contract entails no initial payment, purchasing an option means paying an option premium.

Hedging can go wrong, of course, and I will give you an example. Suppose a U.S. computer company sells its products in Germany, where it competes with another U.S. manufacturer. Suppose the first company is worried about the risk of a rising dollar that would make its computers less competitive in Germany. To hedge against that risk, the company enters into a contract to sell the mark forward. The company expects to have a profit on its forward contract, which would counteract the expected loss on its sale of computers if the dollar rises against the mark. Suppose further that, instead of rising, the dollar falls against the mark. The firm now has a loss on its

Glossary

Counterparty The parties to an over-the-counter derivative transaction are known as counterparties.

In the Money Options are referred to as in the money, at the money, or out of the money. An in the money option would lead to a positive cash flow for its holder if exercised immediately. An at the money option would lead to a zero cash flow if exercised immediately, while an out of the money option would lead to negative cash flow if exercised immediately.

Inverse Floater A debt instrument whose coupon fluctuates inversely with a level of a given interest rate index. The price of an inverse floater varies inversely with the level of the interest rate, but more sharply than the price of a fixed-coupon bond. Thus, investing in an inverse floater is similar to a leveraged investment in fixed-coupon bonds.

Interest Rate Cap An interest rate cap protects a floating-rate borrower against a rise in interest rates. The seller pays the buyer at specified intervals over the life of the contract the difference (if any) between a specified reference rate and the cap rate.

Interest Rate Floor An interest rate floor protects a floating-rate investor against a decline in interest rates. The seller pays the buyer at specified intervals over the life of the contract the difference (if any) between a floor rate and a specified reference rate.

Interest Rate Collar An interest rate collar is the purchase of an interest rate cap and the sale of an interest rate floor.

London Interbank Offer Rate (LIBOR) The rate of interest offered by banks for deposits from other banks in the Eurocurrency market.

Mortgage-Backed Securities These securities are created when a financial institution sells its residential mortgage portfolio to investors. The mortgages are put into a pool and investors acquire a stake by buying units entitling them to a share of principal and interest payments in the underlying mortgages. These units are known as mortgage-backed securities. The timing of the payments received by investors depends on the prepayment rates of the mortgages in the pool.

Swap A swap is an agreement between two parties to exchange a series of cash flows for a period of time. The main categories of swap contracts are interest rate, currency, equity, and commodity swaps.

Plain Vanilla Interest Rate Swap The most common type of swap, it consists of an exchange between two parties of fixed-rate interest for floating-rate interest in the same currency.

Basis Swap An exchange between two parties of floating-rate interest payments pegged to two different indexes, such as a three-month Treasury rate for a three-month LIBOR.

forward contract. If the hedge is set up correctly, that loss would be just offset by a larger profit on the sale of computers. Suppose, however, that the firm's main competitor was not so hedged and in response to the strengthening mark reduces its prices in Germany. Then the firm's sales and profits are lower than it had expected because its computers are now less competitive. In addition, the firm is still losing money on the foreign exchange hedge. Meanwhile, the firm's stockholders and financial analysts expect higher earnings because of the weak dollar. Those expectations would not be realized.

The Gillette Company had \$1.2 billion dollars in derivatives contracts in 1994, versus \$980 million in the previous year. These derivatives consist of basis swaps to achieve desired floating-rate debt, currency swaps and forward contracts to shift debt into desired currencies, and out-of-the-money average basket currency options to protect dollar profit against major adverse currency developments in Europe.

Gillette has been careful to establish risk control measures for its use of derivatives. These include clear policy, procedures, and limits. The company requires central execution, meaning that only the corporate

treasury department can execute transactions. The weighted average credit rating of Gillette's counterparties in transactions was AAA last year. Gillette has in-house expertise that allows it to model and price its derivative positions independently. In addition, Gillette uses multi-bidding: It requires bids from at least two potential counterparties, thus providing an additional check on the prices the company is paying.

Hedging Interest Rate Risk at Bank of Boston

*Bradford H. Warner, Group Executive,
Treasury, Bank of Boston*

I will describe managing interest rate risk by hedging with derivatives, from the perspective of a financial intermediary, in this case a regional bank. A bank's performance is very sensitive to movement in interest rates. The interest rate risk arises from mismatches in the maturities of its various loans and deposits, whose interest rates change at different times. The maturities of loans and deposits must be responsive to the demands of the bank's corporate and retail customers, and this does not leave the bank in a naturally hedged position. Moreover, the bank is exposed to the option-like prepayment risk of its mortgage portfolio. Derivatives provide the bank with a versatile and efficient tool for actively managing those risks and achieving a preferred balance of risk and return.

At Bank of Boston, we use two measures of interest rate risk. The first is a simulation model that allows the bank to measure how net interest earnings would respond short-term to various interest rate scenarios. The second and longer-term model measures how the market value of the company will change under different interest rate environments. This model takes account of how interest rates affect the bank's assets, liabilities, and off-balance-sheet positions. Bank of Boston assesses longer-term effects of interest rates using the market value model, and in 1994 the Bank relied primarily on the readings of that model to guide its decision-making because it fits its balance sheet structure well.

Table 1 describes Bank of Boston's balance sheet as seen through the lens of the market value model. It shows what would happen to three basic components of the balance sheet—the core businesses, and securities and derivatives in the risk management portfolio—if interest rates rose or fell by 100 basis points (1 percent). On the basis of its core businesses alone, the bank was positioned to benefit from rising rates,

Table 1
Market Value Model's View of Bank of Boston's Exposure to Interest Rate Risk
\$millions

	Variation in Market Value: January 1994	
	Rising 100 bp	Declining 100 bp
Core Businesses	46	(88)
Risk Management Portfolio		
Securities	(43)	38
Derivatives	(63)	92
Total Net Exposure	(60)	42

but to mitigate against that natural sensitivity the bank had positions in securities and derivatives that were set to benefit from falling rates. At that time, interest rates were falling, but a month later in February of 1994 monetary policy shifted and rates began to rise. We decided early in this rate cycle that the bank's balance sheet position needed to be changed so that it would not suffer from the rise in rates. The bank settled on a series of derivatives solutions. It purchased \$1.5 billion worth of call options on swaps, which gave it the right but not the obligation to enter into a series of swaps in which it would pay a fixed rate of interest in exchange for a floating rate. The bank also established a position in Eurodollar options that capped its exposure to a rise in interest rates within a predetermined range, and it sold strips of Eurodollar futures contracts.

Table 2 shows what happened to the market values of the bank's portfolio in the 12-month period

Table 2
Results of Bank of Boston's Hedging Strategy in 1994
\$millions

	Increase (Decrease) in Market Value
Core Businesses	467
Risk Management Portfolio	
Securities	(125)
Derivatives	(254)
Net Change in Market Value	88

from January through December of 1994 (interest rates rose over that period). The core portfolio of assets and liabilities appreciated by \$467 million. This reflects the fact that the bank's assets have mostly floating interest rates, and thus appreciate as rates rise, while its liabilities have a longer duration. In addition, the bank has a mortgage servicing portfolio, which appreciates as rates rise. The securities the Bank held for risk management purposes and derivatives depreciated by \$379 million, and overall Bank of Boston's net market value increased by \$88 million. Thus, by using derivatives the bank translated a potential loss of \$40 million to \$50 million (if rates had declined) into a net gain of \$88 million in market value.

You could look at this result and ask, "Why did you use derivatives at all? If you had not used them, you would have made half a billion dollars." Of course, with perfect information about what the future holds, one need not hedge. But without perfect information about the future, there is too much risk in leaving the portfolio unhedged. So we use derivatives to

create a prudent balance of risks and expected returns.

Bank of Boston could have achieved a similar balance sheet profile by raising a lot of long-term, fixed-rate debt, but that would have resulted in undesirable funding concentrations and additional capital requirements. Using derivatives instead avoided that problem and provided a number of additional benefits. In particular, derivatives are more efficient for a bank because they use less capital and do not reduce liquidity.

Using Derivatives for Arbitrage

*David R. Mittelman, Senior Vice President,
Harvard Management*

Interest rate swaps are one of the most basic and fundamental building blocks of the derivatives marketplace. I will very quickly define the swap market and then describe how we use the swap market to identify arbitrage opportunities in bond markets. A

Treasury Bond Arbitrage

Table B-1 shows the price, yield to maturity (YTM), internal rate of return (IRR), and spread (IRR less YTM) of a 7.25% coupon bond and a 13.75% coupon bond, both maturing on 8-15-2004. The prices and yields to maturity are those bid on 7-25-1995. The IRR was calculated by discounting the cash flow of the bonds by the corresponding swap rates from the swap yield curve. In this example, the yield pickup of the high vs. low coupon bond is approximately 5 basis points.

Table B-2 shows how to realize this yield pickup by combining the high coupon bond with the zero coupon Treasury strip to replicate the cash flows from the lower coupon bond. The first row shows the price and yield to maturity of the low coupon bond, the second row the high coupon bond, and the third row the zero coupon strip. The fourth row shows the "synthetic" low coupon bond that is replicated from the high and the zero coupon bond. The ratio of high to zero coupon bond is found by dividing the low coupon into the high coupon: Ratio = 7.25%/13.75% = .52727. Then the bonds are combined in that proportion:

$$\begin{aligned} .527273 \times 149.12 &= 78.6270 \\ + .472727 \times 55.578 &= \underline{26.2732} \\ &104.9002 \end{aligned}$$

Table B-1

1	2	3	4	5 = 4 - 3
Bond	Price	YTM	IRR	Spread
7.250% 08-15-2004	105.24	6.475	6.763	.288
13.750% 08-15-2004	149.12	6.490	6.723	.233
Yield Pickup				.055

Table B-2

Bond	Price	YTM
7.250% 08-15-2004	105.24	6.475
13.750% 08-15-2004	149.12	6.490
0% 08-15-2004	55.578	6.595
7.250% 08-15-2004	104.90	6.524
Yield Pickup		.048

bond investor can use derivatives as benchmarking devices to determine the relative values of bonds, and then use derivatives as tools to extract that value without incurring ancillary risks. In particular, we use the interest rate swap market to value Treasury bonds.

A swap is an agreement between counterparties to exchange one set of cash flows for another for a prescribed period of time, based on a fixed rate or formula. The most common interest rate swap is an exchange of payments at a floating rate for payments at a fixed rate of interest. The swap market is very liquid, and the smooth and continuous term structure of swap interest rates (also known as the LIBOR term structure) can be used to value virtually any fixed-income instrument. The box "Treasury Bond Arbitrage" provides an example of two non-callable Treasury bonds maturing on the same date nine years from now—one with a 7.25 percent coupon and one with a 13.75 percent coupon. While the two bonds have similar yields to maturity, the high-coupon bond has a lower internal rate of return than the low-coupon bond.¹

It is possible to combine the higher coupon bond with a zero-coupon Treasury strip in a ratio that would exactly reproduce all the cash flows of the lower coupon bond. This "synthetic" Treasury bond, which is quite simple to create, offers investors an increase in yield equal to the difference in the internal rates of return on the two bonds (again, see the box).

By using the interest rates from the swap market as the discount rates, disparities can be identified even in a market as "efficient" as the U.S. Treasury market. By using swaps, strips, futures, or other types of derivative products those opportunities can be captured, in many cases without any loss of liquidity or credit. Moreover, this technique can be used in any market in the world in which the swap market exists.

It is also possible to value more complex financial contracts, such as amortizing securities or those with uneven payment schedules, using the same cash flow discounting techniques. In these cases, another benefit unique to the derivative marketplace becomes obvious. Owing to the flexible nature of the derivative markets, perfect cash flow matching hedges can be created using strips of Eurodollar futures, amortizing swaps, or swaps of virtually any payment structure.

¹ The difference between a bond's internal rate of return and its yield to maturity arises because of the difference in the discount rates used in discounting the bond's cash flows. Yield to maturity is calculated with a constant discount rate, while internal rate of return is calculated by discounting each cash flow by the corresponding rate from the swap yield curve.

This eliminates the need to take the risk inherent in the generic hedges of selling Treasury bonds with fixed cash flows against issues that do not have the same fixed cash flows.

Use of Derivatives by a Public Agency

*The Honorable Joseph D. Malone,
Treasurer and Receiver General,
Commonwealth of Massachusetts*

As Treasurer of the Commonwealth of Massachusetts and fiduciary for the investment of about \$16 billion in funds, I deal with many of the specific issues on the agenda today. Approximately \$13 billion represents assets in the Commonwealth's two largest public pension funds, MASTERS and PRIM. The pension assets are invested to achieve a maximum long-term rate of return, in order to achieve full funding of the state's pension system by 2028. We manage \$1 billion on deposit with the state's deferred compensation plan. A \$1 billion Massachusetts Municipal Depository Trust (MMDT) and internal cash portfolios are also invested, with the goal of providing liquidity to the Commonwealth and the other participants of MMDT.

The Commonwealth does utilize derivatives in its investment portfolios where they are appropriate and consistent with their written investment objectives and policies. Certain of MASTERS and PRIM's investment advisors utilize derivatives; these include such commonly used products as S&P 500 index futures, used by a passive equity manager; certain lower-risk mortgage derivatives, used by fixed-income managers; and currency futures and forwards, used to defensively hedge the exposure of the international securities. However, the fund managers are prohibited from investing in derivatives that replicate a risk not otherwise permitted in a particular portfolio, such as a currency risk in a domestic portfolio; derivatives that are improperly leveraged; and derivatives that are considered to be high-risk. The latter are primarily those fixed-income products that place at risk the repayment of principal at maturity. These guidelines are consistent with the goal of the pension funds to maximize the long-term return on assets over a 20- to 30-year horizon, where short-term returns and liquidity are not emphasized.

The MMDT and the in-house cash portfolios are handled differently. The primary investment objective of these funds is the preservation of principal and assurance of liquidity. Based on this objective, neither

portfolio manager—Fidelity in the case of MMDT and Treasury personnel in the case of the in-house portfolios—is permitted in its guidelines to invest in any derivative products.

In the past few years we have undertaken reforms and achieved an investment structure and oversight procedure that I hope will serve us well in coming years. We were the first public pension fund to require that all providers of investment services disclose in writing all their relationships with middlemen and other marketers with respect to Commonwealth business. We broadened on our own initiative the powers

The dangers of the financial system are not limited to derivatives.

of our MASTERS' Oversight Committee, and at PRIM, we established a series of subcommittees to review all staff recommendations, to ensure that the appropriate level of due diligence had been completed. Finally, we have solicited and received the assistance of leading private and academic professionals in order to bring the oversight necessary to do the job right.

In conclusion, I would like to emphasize that the dangers of the financial system are not limited to derivatives. In fact, we must be vigilant that the current fervor concerning derivatives by those who may not understand the term does not unduly discourage their appropriate use by responsible investors.

III. The Risks and Advantages of Structured Notes and Mortgage-Backed Securities

An Analysis of Structured Notes and Mortgage-Backed Securities

Peter Tufano, Associate Professor, Harvard Business School

As the only non-practitioner on this panel, I would like to describe a conceptual framework for analyzing mortgage-backed securities and structured notes as packages of bonds and options. To set the stage, I will start with a specific example of a securities

package having a fixed rate coupon of 8 percent and maturing in 10 years, at most. Would you want to buy this package? The principal balance may decline over time, and it will decline faster in a low-interest-rate environment. Such a package could represent a number of different instruments. It could be one of the older, traditional instruments, such as a callable corporate bond or a callable Treasury bond. Alternatively, it could be a mortgage-backed security. Since people tend to prepay their mortgages more often in low-interest-rate environments, the principal balance is bound to decline. Or, this could be a structured note, such as an index-amortizing note, where the coupon is fixed at 8 percent but the principal balance amortizes. And finally, this could be a combination of securities, such as a fixed-rate bond minus a call option, or a money-market investment coupled with an index-amortizing swap.

The instruments described above, while functionally equivalent, have many important differences, particularly in the institutional details that surround them. One obvious difference is credit risk. A Treasury bond issued by the U.S. government has a different credit risk from that of a corporate bond or a structured note sold by a Wall Street dealer. The credit risks of instruments with embedded options differ from those with unbundled options, because in unbundled packages the credit risk of the party issuing the bond is not the same as that of the party issuing the option.

The instruments differ in the structure and predictability of their call features. With an amortizing note, the investor knows exactly how the note's principal balance will decline as a function of interest rates. With a mortgage-backed security, the investor does not know this exactly because prepayments on mortgages cannot be predicted with great accuracy. The instruments also differ in their liquidity and transaction costs. The mortgage market, for instance, is large and liquid, which means that bid-ask spreads tend to be tight. The index-amortizing note market is less liquid, however, and bid-ask spreads tend to be larger. Differences are also found in regulatory treatments and, for banks, in capital requirements. Accounting treatments and tax implications also differ for various instruments, even though they may be functionally equivalent. Finally, the instruments differ in their prices and rates of return. Thus, when comparing the five or six ways to get the same basic payoff, the investor must evaluate a list of characteristics, such as credit risk, structure of options, liquidity, regulatory and accounting treatments, impact on

taxes, price, and return, and the investor must also understand their relative importance.

But how do you decide if any of these instruments are appropriate investments? We can think of investment decisions in terms of three basic approaches:

- the effect of the new investment on the existing portfolio, in terms of risk and return;
- a directional view of the market, or speculation;
- exploitable mispricing in the market, or arbitrage.

In each of these situations, you should ask a number of specific questions. For portfolio effect, the investor must first evaluate the structure of the existing portfolio. A bank, for example, would evaluate its current assets and liabilities and how their market

*A conceptual framework
is available for analyzing
mortgage-backed securities
and structured notes as packages
of bonds and options.*

values would change as interest rates change. Second, the investor should think about the goal of the overall portfolio in terms of risk and return. And finally, the key question must be how the new investment will contribute to the return and risk of the overall portfolio.

In taking a directional view of the market, the investor should ask himself four questions: What is the precise bet I am trying to make? On what basis do I believe that I can "beat the market"? Does the investment make the precise bet I want, and no others? And, how will the bet perform under extreme circumstances?

About a year ago, a type of instrument called a squared LIBOR swap (also known as the turbo swap or power swap) received a lot of attention in the press. These instruments behaved reasonably when analyzed in a narrow range of interest rates. However, when interest rates went to extreme levels, these instruments caused enormous gains and losses. Therefore, it is myopic to look only at small ranges of interest rates and to fail to consider what would happen to the portfolio if the bet turns out to be wrong by a large margin.

In using derivatives to exploit arbitrage opportunities, the investor should ask three questions: Can I

set up the offsetting trade that eliminates my risk? If the arbitrage gap remains open or widens temporarily, can I sustain the position? Are new risks created by this arbitrage? In particular, people sometimes forget that they take on credit risk in order to set up some "arbitrage" trades. Whether the purpose of the investment is modifying an existing portfolio, making a bet, or arbitrage, the investor should make sure the investment is fairly priced. The investor could shop around and get several quotes for the same instrument from different dealers, hire a consultant to help price the investment, or compare prices of alternative investments to each other. Or, finally, the investor could break the packages apart and value the pieces separately using an appropriate model and market data. The investor needs a fair amount of sophistication and understanding of the models to do this, perhaps requiring the advice of an independent consultant.

Essentially, structured notes, mortgages, and derivatives more generally have offered the investment community a new technology. I would hope that all of you can figure out how to embrace this technology and make the best use of it in your own businesses.

Inverse Floaters

*William Demchak, Managing Director, Derivatives Market,
J.P. Morgan Securities, Inc.*

Over the past year the press has sensationalized derivatives and derivatives losses. I would like to begin by putting the recent derivatives losses in perspective, in relation to more general market moves over the same period. In particular, from year end 1993 to year end 1994, the U.S. Treasury market, on average, lost about 9¼ percent of its principal value. This amounted to \$221 billion of lost wealth incurred by investors in the U.S. Treasury market. We did not read about this loss in the press, while the losses in derivatives such as structured notes, although much smaller, received a lot of coverage.

A structured note has been described as a bond with an attached derivative. Like any other security, it should be carefully evaluated in terms of risk and in terms of your own portfolio. One type of structured note is the inverse floating-rate note, whose interest payments change in the opposite direction from the level of interest rates. Investing in inverse floating-rate notes is equivalent to taking a leveraged position in bonds. For example, you can buy \$30 million in bonds for an investment of \$10 million, by borrowing \$20 million at a floating rate of interest. Alternatively, you

Management Control of Derivatives: An Outline for End Users

Summary: understanding your portfolio; setting objectives and risk parameters; implementing operating procedures; disclosing to relevant audience.

Understanding your portfolio: appropriateness of the underlying instruments; standardized versus OTC contracts; direct versus indirect leverage; "covered" versus "naked" positions.

Parameters for market risk: elements of "value at risk"; "normal" deviations and stress scenarios; continuing validity of correlation assumptions; liquidity and pricing criteria.

Parameters for credit risk: exchange-traded contracts—clearing corporation; OTC instruments—counterparty exposure; credit enhancement and collateralization; capital cushion for insolvency.

Implementing legal procedures: legal authority and authorization procedures; proper documentation and master agreements; settlement arrangements and netting procedures; taxes and transaction costs.

Implementing monitoring procedures: daily marking to market; reporting procedures and special triggers; measuring performance of program; internal and external audits.

Making appropriate disclosures: disclosures to customers—product suitability; disclosures to shareholders—financial statements; disclosures to regulators—systemic issues.

Robert C. Pozen, General Counsel and a Managing Director of Fidelity Investments in Boston

can buy an inverse floater for \$10 million which would be similar to this leveraged investment. Orange County had both leveraged positions in bonds through repurchase agreements and investments in inverse floaters. In some cases, they used inverse floaters as collateral for repurchase agreements, thus doubling their leverage. Interestingly, Orange County lost more money in leveraged bond positions than in

inverse floaters, which performed somewhat better. Nevertheless, the loss was described in the press as a big derivatives problem, rather than the leverage problem that it really was.

Appropriate Use of Derivatives

Kris Mahabir, Managing Director, AIG International Inc.

My background includes five years as an investor at Fidelity, so the attraction to me of the derivatives market has been to find opportunities to make money, to achieve a higher return than is available in the bond market, or to achieve increased diversification for my portfolio. However, it is essential for every investor to understand the risks involved and take on only appropriate investments. I will give examples of derivative securities that, in my view, are appropriate for different types of investors with various objectives and appetites for risk.

For money market funds, the suitable opportunities in derivatives are limited because the funds must maintain stable principal value. One of the few such instruments I could recommend to money market funds is a capped floater. It generates a marginal increase in yield and is capped at a certain point if rates rise.

The next class of investor, the short-term bond fund, is allowed to take some principal risk. Mortgage-backed securities would be appropriate for such a fund, allowing it to diversify the risk of the portfolio into comparable instruments. Mortgage-backed securities pay a fixed coupon rate, but the principal amortizes at a variable rate depending on prepayments. Making such an investment is equivalent to betting against the long end of the Treasury yield curve, because if the 10-year Treasury rate to which fixed-rate mortgages are indexed falls, then prepayments will accelerate and the duration of the investment will shorten. Investing in mortgage securities is similar to an investment in an index-amortizing note or an index-amortizing swap.

The municipal bond investor can take still more risk than a short-term bond fund, because municipal bond funds typically invest in longer-duration securities. There is also a tax effect, however, which states that the interest that the municipal investor receives is tax free, so long as leverage is limited to two times or less the amount invested. Given this limit on the amount of leverage, the municipal bond investor should invest in the longest-maturity instruments and leverage them by a factor of two. Then the investor

should manage the duration of the portfolio by shorting Treasury futures, for example. Other ways to manage the duration of the portfolio include embedded options or swaps.

Total return investors can invest in equities. Indeed, their benchmark asset is equities, and often they will not make an investment unless it can provide similar returns. If it does, then the investor can benefit from the diversification provided by exposure to a different market. For example, in 1993 short-term interest rates were very high in Europe and a lot of people expected them to come down. How could an investor profit from that view? A total return investor could not simply go out and buy short-term debt in a European country because such debt did not provide sufficient return, even if the view was correct. Instead, the investor could enter into a trade with a leveraged exposure to the short end of the yield curve. The level of leverage must be carefully chosen to be appropriate for the given portfolio. For example, if the portfolio's benchmark duration is five years, then the investor can leverage the short-term bonds to provide an effective duration of five years.

I have given you my view of the process of investing in derivatives, particularly structured notes, that you as investors should follow. To summarize, your first objective should be to identify the classes of trades that are suitable, given your particular benchmark and acceptable risk. Then, because structured notes offer opportunities that can arise relatively suddenly, you need to identify in advance what entry points are going to be attractive. Finally, the paperwork and documentation should be in place in advance, so that you are ready to take advantage of an opportunity at any given time.

IV. Risk Management and Controls

Management Control of Derivatives

*Robert C. Pozen, General Counsel & Managing Director,
Fidelity Investments*

I plan to focus on the practical aspects of setting up a derivatives program, and I will concentrate on setting guidelines for the program and on its implementation. It is most important that these guidelines be put in writing and placed before your authorizing body, the Board of Directors or a subcommittee of the Board.

The Establishment of Guidelines

The first step in setting up the guidelines is to describe the objective of the program. Is its purpose to manage liabilities? Is it to hedge a stock portfolio or a bond portfolio? Is it to protect against adverse currency movements? What is the time frame for these objectives? Next, the guidelines should describe the scope of the derivatives program. What products will be permitted to be used? Are there any geographical constraints? Most importantly, how much leverage will be permitted?

Market Risk

The next step is setting limits for market risk. To begin, one must define the relevant time frame for taking market risk, then decide on the way it is to be measured. The standard approach involves "value at risk," measured using probability analysis based on a chosen confidence interval (such as two standard deviations) and a chosen time horizon (such as one-day or one-month exposure). Value at risk measures the expected loss from an adverse market movement with a given probability over a period of time. For example, value at risk can be an amount of loss in market value that will not be exceeded with 97.5 percent probability over a given period of time. This approach allows one to measure the market risk across derivatives and risk factors in a consistent manner and to aggregate and compare these risks.

It is important to analyze "stress scenarios" by considering what will happen to the portfolio in cases of adverse and even improbable market environments. In many ways, 1994 saw one of those stress scenarios, in terms of interest-rate movements. Investors must evaluate their ability to withstand such scenarios and develop contingency plans.

The guidelines for risk management should be specific about pricing policy. How often should the instruments be priced? What happens if clear market quotes are not available? How should the instruments be carried on the books on a day-to-day basis? These are complicated questions. A related issue is liquidity. Most investors do not end up holding these instruments to maturity. If they are to be sold, how quickly and at what price can the investor unwind the position?

Credit Risk

Risk management guidelines must also set limits for credit risk. For exchange-traded instruments such as futures, credit risk is limited and confined to the

clearing corporation. Even in the Barings case, the Singapore Clearing Corporation was able to back the contracts. In contrast, the over-the-counter (OTC) contracts, such as swaps, carry a risk of default by the counterparty. Most institutions need to develop a list of the dealers whose credit risk is acceptable to them. Another way to mitigate credit risk is to use credit enhancements, such as third party insurance or collateral for the instruments. But this is expensive, and the investor must choose the appropriate trade-off between costs and benefits. Probably the best strategy is to have a diversified list of approved counterparties supplemented by a capital cushion against the possibility of default by one of them.

Implementation of the Guidelines

A good implementation program is just as important as having clear objectives and risk limits. Legal authority and the authorization process must be well defined. This means making sure that both counterparties have the authority to trade in the instruments being considered. Do they need approval from their superior in the organization or from a regulatory body? Are the trades consistent with the guidelines set forth in the authorizing statement?

A good implementation program is just as important as having clear objectives and risk limits. Legal authority and the authorization process must be well defined.

It is important to have proper documentation. Many derivative trades are done orally, yet if they are not properly documented, counterparties can get into trouble. One way to deal with this is to have a standard document ready to use with specific sets of dealers. Institutions should also use master agreements, because they allow one to put all the trades within one set of legal documents. This also helps with rolling over the transactions and with netting, which allows one to set off different trades with the same counterparty against each other. Netting measures credit exposure more accurately and allows one to set aside less capital. The settlement aspects of derivatives are also critical, although much ignored. As a practical matter, this means that one should not pay cash until

one gets the security, and one should not give up the security until one gets the cash. Unfortunately, this is not always easy to do, especially in foreign markets.

Monitoring and Audits of Performance

The next step is monitoring one's derivatives positions. The most important part of monitoring is daily marking to market. Some people think that they can get away with marking to market on a monthly or even quarterly basis. However, the pricing in the derivative markets changes very quickly and should be monitored daily.

A monitoring system must include the measurement of performance. A surprising number of institutions with derivatives programs never measure how well they do. Some of them say, "Look, we made a profit on this derivative." This is not measuring performance. You must have a baseline for comparison, such as what the profit would have been if the institution did not hold the derivative.

My last point concerns internal and external audits. It is important to have people from outside the derivatives unit checking them periodically. This can be done annually or semiannually by external auditors. However, it really ought to be done more often, by either internal auditors or the compliance department. They ought to check the mark-to-market process and what reports are being generated on a much more regular basis than once or twice a year.

Accounting Treatment of Derivatives

Halsey Bullen, Project Manager, Financial Accounting Standards Board (FASB)

A significant knowledge gap exists between accountants and the derivatives markets and their participants. As you know, accounting is a double-entry system, pretty much designed for cash instruments. Forwards and swaps, though, can be an asset today and a liability tomorrow, to give only one example of the accounting challenges that derivatives markets offer. FASB and other organizations have been studying these matters for some time, including the definition of derivatives, corporate disclosure of their use, and accounting treatment and taxation.

Disclosure of Derivatives Use

FASB's efforts to set requirements for disclosure started in 1986 with Statement 105, which defined the

instruments to be included. The definition is rather narrow and includes forwards, futures, options, swaps, and similar off-balance-sheet instruments. It does not include mortgage-backed securities and structured notes because these are on-balance-sheet debt instruments. Statement 105 asked for disclosures of the notional amounts of these instruments. While somewhat helpful, this disclosure requirement may have encouraged the recent demand for leveraged swaps and other instruments where the notional amount disclosed (following the letter of the rule) is low, but the risk is fairly high. The situation has been changed by more recent standards. Statement 107 requires disclosures of fair values not just of derivatives but of all financial instruments.

In response to continued concern in this area, at the end of 1994 FASB issued Statement 119, which focuses on distinguishing between derivatives held for trading purposes and those held for other purposes. Its most important feature is the requirement that companies disclose the objectives for using the instruments within the context of the rest of the risk management picture of the organization. This includes strategies followed and instruments used to implement those strategies. This is a required disclosure for end users of derivatives. Statement 119 also encourages but stops short of requiring quantitative disclosures about risk management, such as value at risk, gap analysis, and other quantitative measures of market risk. Statements 107 and 119 are already effective for larger firms. For firms below \$150 million in assets, they become effective at the end of 1995.

In response to concern about possible confusion over various disclosure requirements, FASB has prepared a special report, "Illustrations of Financial Instrument Disclosures." In addition, bank regulators and the Securities and Exchange Commission have not been silent on the matter of derivatives disclosure. Banks have new requirements in their call reports starting in March 1995, and the SEC is on the point of issuing additional, more detailed requirements of its own. The Government Accounting Standards Board is also taking note of this area, particularly in repurchase agreements and securities lending.

Accounting Treatment of Derivatives

In the area of accounting, we still find inconsistency, both in current requirements and in the prospects for improvement. Some derivatives now have to be recognized in financial statements. Others do not. Some derivatives that are recognized have to be mea-

sured at market value. Others do not. And some derivatives that are used for hedging can receive special hedge accounting treatment, while others cannot.

Many such accounting problems are of long standing. Anomalies occur whenever the hedging instruments and the hedged items are not measured in the same way. This results in a distorted income statement. The responses to these anomalies have been the hedge accounting pronouncements issued in the early 1970s, Statement 52 on foreign exchange and Statement 80 on futures contracts. (Hedge accounting involves deferral of gains and losses on the hedging instruments until they match up with the hedged item.) This brought limited improvement but, unfortunately, the two statements are not consistent and do not cover all possibilities. It still is possible to take advantage of hedge accounting to postpone recognition of a speculative or perhaps accidental loss or gain until management finds it convenient to report it.

At FASB, we continue to search for better accounting treatment of derivatives. We are exploring several scenarios: mark to market all sides of the hedge; defer recognition of all gains and losses; defer recognition of gains and losses only to the extent that a hedge is effective; mark derivatives to market with realized gains and losses to earnings and defer unrealized gains on risk management derivatives in a special equity component; and a combination of the last two. We are also considering questions of derecognition, when an asset is taken off the balance sheet and sold or securitized. These are not just U.S. problems, but global ones. Half a dozen international accounting standard setters are also working on these questions.

Taxation of Derivatives

I will conclude by identifying a key problem in the taxation of derivatives: A firm should not have to report a capital loss on the hedging instrument at the same time that it reports ordinary income on the hedged item. This was a problem for a while because of conflicting court decisions such as *Arkansas Best* and *Fannie Mae*. New IRS regulations alleviate much of the problem; however, it is important for derivative users to get tax advice.

Jurisdiction over Derivative Contracts

*Nathan Most, Senior Vice President,
New Products Planning, American Stock Exchange*

I am going to talk briefly about the ambiguity of jurisdictional authority between the Commodities and

Futures Trading Commission (CFTC) and the Securities and Exchange Commission (SEC). The issue of jurisdiction poses real problems for someone like me, who is involved in designing and marketing new instruments. Many investors will not trade a commodity instrument under CFTC jurisdiction because they consider it to be very risky. They will, however, trade a very similar instrument under SEC jurisdiction because they think it is equivalent to trading a stock.

The ambiguity about jurisdiction between the two agencies arises because the Act that created the CFTC did not define a futures contract. Since then, a number of attempts have been made to define it, but it appears that the CFTC does not want to adopt a definition that might limit its area of jurisdiction. There is, however, a very clear definition of what a commodity is: The Act says that a commodity is "anything on which a futures contract has been traded in the past, the present, or may be traded in the future."

Even though the CFTC Act does not define a futures contract, it does impose a heavy penalty if a contract is later legally found to be a futures contract and is traded away from a designated market. This means that an organization like the American Stock Exchange or a clearing organization that issued the contract runs a considerable risk. The biggest risk for an exchange is that all the losers who had positions in that contract will come back and say, "This is an illegal contract. We want our money back."

I would like to see the CFTC accept a clear definition of a futures contract, so that we at least can know the kind of playing field we are on. This would greatly reduce the costs of new product development, as well as the time required, and it would be beneficial to the entire trading community.

Theories of Legal Liability in Derivative Transactions

Hal S. Scott, Professor, Harvard Law School

My subject for today is liability in connection with derivatives transactions. As I am sure you are all aware, personally or from reading the press, we have an explosion of lawsuits in the area of derivatives. By some accounts, at least 30 multi-million-dollar lawsuits involving derivatives are currently in various stages of disposition. Noteworthy recent examples are a claim by Gibson Greetings against Bankers Trust for \$32 million in damages, and a claim by Procter & Gamble against Bankers Trust for \$195 million which was settled for approximately \$14 million. The largest

recent lawsuit was filed against Merrill Lynch last January by the Orange County Investment Pool, for \$3 billion.

Many of the transactions underlying the recent litigation were swaps or structured notes reflecting bets that interest rates in 1994 would stay constant or go down. A rise in interest rates very quickly put these derivative users in the red. It is imperative that both users and sellers of derivatives be fully counseled about the emerging law in this area. I can only give you an overview of that law today.

Ultra Vires

Four principal theories underlie derivatives litigation. One is *ultra vires*, the second is contract, the third is fraud, and the fourth is suitability. *Ultra vires* is the claim that the customer was prohibited by law from engaging in a particular transaction and therefore is not bound by that contract. For example, Orange County claims that the transactions it entered into with Merrill Lynch were prohibited by the California Constitution because they required Orange County to become indebted to an amount in excess of its revenue for the year. Similarly, in an action against Lehman Brothers Commercial Corporation, China International United Petroleum and Chemical Company (UNIPEC) claims that its foreign exchange swaps were in violation of Chinese laws prohibiting all persons except those approved by the State Administration of Exchange Control (UNIPEC had not been approved) from engaging in foreign exchange transactions.

Contract Claims

The second set of claims is based on the contract itself, and includes two main sets of contract claims. The first is that the corporation is not bound by the agreement, a claim somewhat like *ultra vires*. Gibson argued that the swap with Bankers Trust was not binding because it was made under economic duress in a situation of financial emergency, and a principle of contract law holds that contracts made under economic duress are not binding. The second type of contract claim is that the contract itself should embody certain prior oral understandings reached between the parties. If it does not, then no meeting of the minds took place between the parties, and thus no contract at all. For example, Procter & Gamble claims that it never agreed to an allegedly secret and proprietary Bankers Trust early lock-in pricing model as a term of its derivative transactions. UNIPEC claims that it had an

oral agreement with Lehman Brothers, which was not honored, to close out all transactions if they reached a debit position of \$8 million or more.

Fraud Claims

The third theory of liability is fraud. The fraud claims, which are based principally on a lack of disclosure, arise out of common law—that is, case or court law—or statutory law related to securities and commodities, which is based on either the Securities Act of 1933 or the Commodity Exchange Act of 1934. As the common law generally imposes no duty to reveal all material information, plaintiffs in these cases have a strong incentive to fit derivative transactions into coverage under the Securities Act or the Commodity Exchange Act.

Coverage under these Acts hinges on whether certain derivatives are deemed securities or commodities. The matter is as yet undecided by the courts. The regulatory agencies, however, have taken certain actions that bear on this question. As a result of the Gibson Greetings case, the CFTC and the SEC both initiated investigations of Bankers Trust that resulted in consent orders whereby it was determined that Bankers Trust had committed statutory fraud in the sale of certain derivatives. The SEC concluded that two of the 12 types of swaps Gibson Greetings had with Bankers Trust were securities, while the other 10 swaps were not. The swaps that the SEC determined were securities were based on Treasury bill reference rates, while those that were not were based on LIBOR reference rates. The SEC decided that the Treasury-based swaps were equivalent to cash-settled options. Options are securities. Therefore, the swaps are securities.

What the distinction is between the Treasury bill reference rates and LIBOR reference rates, as it bears on the question of what a security is, is a mystery to me. Subsequent to the SEC order, Procter & Gamble amended its complaint against Bankers Trust to include causes of actions based on violations of securities laws.

Suitability Claims

The fourth theory of liability is a suitability claim, which may be based on a claim of violation of fiduciary duty or a violation of Rule 10B5 of the 1934 Securities and Exchange Act or some combination of the two. Courts generally agree that the following four elements are fundamental to a suitability claim: the

defendant recommended or purchased the investment for the plaintiff; the investment was unsuitable for the plaintiff; the defendant either knowingly or recklessly and thus fraudulently recommended the unsuitable investment; the plaintiff reasonably relied on the defendant recommendation and made the investment.

One appellate court has added a fifth element requiring that the plaintiff demonstrate that the defendant exercised control over the plaintiff's account, but that is only one court. Use of a suitability claim by a large investor, such as Orange County, Procter & Gamble, or Gibson Greetings, would at first appear problematic. But the City of San Jose effectively utilized a suitability claim to win a jury verdict against broker-dealers, thus demonstrating the potential use of suitability claims even for large investors who would generally be considered sophisticated. Even so, the sophistication of an investor will still be a critical factor in a suitability claim.

An investor's sophistication is also important to understanding the intent of the defendant in recommending the investment, which, in turn, bears on the question of fraud. If a defendant recommends a speculative investment to an unsophisticated investor who, the defendant knows, has or is likely to have conservative investment goals, this is likely to result in a conclusion of fraudulent intent. On the other hand, if a defendant recommends a speculative investment to a sophisticated investor with generally conservative investment goals, that might be interpreted as an offer to the investor to change its investment objectives and goals. If the sophisticated investor accepts the recommendation, the acceptance can be viewed not as succumbing to fraud, but rather as an actual change in investment goals themselves. This only applies to the sophisticated investor, however.

How does a court determine if an investor is sophisticated? Courts have generally eschewed any presumption of sophistication. They examine each individual investor's educational background, knowledge of finance, and history of investing. Moreover, courts frequently examine an investor's ability to understand the specific investment at issue rather than just assuming that if you are sophisticated you can understand everything. This is particularly important in the derivatives context.

When the plaintiff is a legal entity, such as a city, college, or company, the courts have focused on the understanding of the individuals immediately responsible for the entity's investment decisions rather than the sophistication of the entity itself. There are established industry standards about suitability in general,

such as the New York Stock Exchange's "know your customer" rule and the NASDAQ suitability rule. However, these rules do not quite fit for derivatives. As a result, the derivatives industry has recently made efforts to formulate a voluntary framework for standards relevant for suitability and for disclosures that deal with derivatives issues.

What is the relevance of these efforts to the legal liability issue? These standards may come in as evidence in court. The plaintiff may say, "Look, here is a document that says, 'you should do A, B, C, and D' and you didn't do it. That is evidence that you were not fully disclosing or that you were recommending an unsuitable investment." What weight such standards will receive as evidence remains to be seen.

In conclusion, I would stress that liability for derivative transactions is an emerging area of law. Dealers need to be aware of their potential liability so that they may avoid it. Users need to be aware of their rights. Although the sophistication of users will play a substantial role in liability issues, it is not a show-stopper. Sophisticated investors may also act outside their authority, have a claim for breach of contract, be defrauded as a result of lack of disclosure, or invest in unsuitable investments.

V. Is More Regulation Necessary?

The Honorable Edward J. Markey, Member of the U.S. House of Representatives

One of the continuing challenges for legislators and regulators is striking the appropriate balance between assuring our nation's financial markets are well regulated and adequately protect investors, and not imposing unnecessary or burdensome regulations on business. I would like today to give you a congressional perspective on the consequences of derivatives for our financial system, and some ideas on how our nation's regulatory apparatus can promote the fair and efficient operation of this vitally important market and meet the diverse needs of the dealers and end users that participate in it. My remarks are based on the information gathered by the Subcommittee on Telecommunications and Finance that I chaired from 1987 through 1994, and of which I am now ranking Democratic member. During the past two years I conducted five oversight hearings on the derivatives markets, and the General Accounting Office provided our subcommittee with a report last year. We have also held numerous conversations with

market participants and regulators who are experts on the subject.

I recently introduced the Derivatives Dealers' Act of 1995 (HR 1063), which would authorize the Securities and Exchange Commission to oversee certain currently unregulated derivatives dealers, such as those affiliated with securities or insurance firms. The bill would require such dealers to register with the SEC and empower the SEC to set capital standards for such dealers, conduct inspections or examinations of such dealers, and receive financial reports from them.

The bill would protect investors by allowing appropriate sales practices rules, including suitability rules, to be established for such derivatives dealers. It

Voluntary guidelines are not a substitute for an effective system of oversight and supervision, since they provide no assurance that all of the unregulated dealers who should adhere to a voluntary framework will do so.

would enhance the SEC's antifraud and anti-manipulation authority over such derivatives dealers and define equity derivatives as securities, thereby clarifying their coverage under the antifraud provisions of the federal securities laws. This legislation is necessary to close the regulatory gap that now leaves some dealers regulated and others unregulated. We cannot allow the continuation of a situation in which the SEC is fated to be the Blanche DuBois of our financial regulators—always relying on the kindness of strangers.

The SEC, working with six securities firms, has developed a voluntary framework of guidelines aimed at addressing many of the concerns covered in his legislation. While this voluntary framework contains many positive elements, it falls short when it comes to sales practices and risk disclosure. For example, the guidelines state at one point that the firms "have agreed to adopt the practice of providing new professional counterparties with a written statement identifying the principal risks associated with over-the-counter (OTC) derivatives activities and clarifying the nature of the relationship between the parties." Else-

where the report merely suggests that a dealer “should consider providing” such information. Which is it?

The draft set of principles and practices developed by the Federal Reserve Bank of New York is inadequate in terms of protection afforded to customers. For example, the draft proposal appears to impose no affirmative duty or obligation on dealers to disclose anything to their customers about the risks associated with a derivatives transaction. Even if the voluntary guidelines were improved to provide more protection for customers, they would not be a substitute for an effective system of oversight and supervision. They provide no assurance that all of the unregulated dealers who should adhere to a voluntary framework will do so.

While the National Association of Securities Dealers (NASD) has issued proposed rules relating to sales practices and suitability, even the revised rules have failed to provide comparable suitability protections for a number of derivative products that are not as clearly defined as securities. Regulators must minimize the potential for derivatives to contribute to disruptions in the U.S. and global financial systems, and take action to harmonize derivatives regulation in the United States and abroad.

The Concerns of the Federal Reserve System

The Honorable Susan M. Phillips, Member of the Board of Governors of the Federal Reserve System

I would like to outline the interest of the Federal Reserve System in derivatives, both as a central bank and as a bank supervisor. As a central bank, the Federal Reserve is concerned about systemic risk that might jeopardize the financial stability of the markets, both domestic and international. From a bank-supervisory standpoint, the Federal Reserve wants to protect the federal deposit insurance program and ensure that the supervised financial institutions are not themselves a source of systemic risk.

The financial system has proved quite resilient to recent shocks. The past two years have seen significant changes in interest rates and exchange rates. As a result, shocks have been felt from large entities facing problems, such as Barings Bank and Orange County. Just because losses occur, however, does not necessarily mean that systemic risk is present. Systemic risk is not just something that affects Wall Street, but also something that has the potential to affect Main Street. By definition, it involves real macroeconomic activity, either in the long run or in the short run.

A systemic crisis could start anywhere. It can start from a cascading of asset prices or from the demise of a major financial institution. The causal factors are unpredictable, and the effects may vary depending on the number and size of firms involved. It would also

The recent shift in focus from the development of derivatives instruments to the management of risk in the derivatives market is a positive trend.

depend on the economic environment. A strong economy may be better able to withstand shocks. Characteristic of a systemic crisis is that market participants start holding back payments, causing gridlock. This can lead to a disruption of payment and settlement systems. As the crisis spreads more broadly, it can cause a more general disruption of financial or credit markets. The risk of contagion varies, depending not only on the economic environment but also on the specific nature of the firms involved and how idiosyncratic the problem is.

For example, no systemic risk was associated with the Barings problem, despite the fact that it was an old, large, and reputable firm, and despite some disruption to several exchanges. The potential problems with Barings were thought to be isolated because they were seen as associated with the internal controls of this particular firm and not as a widespread problem. Second, exchange markets were involved, so the perception was that an institutional process was in place to work out the problems.

The Federal Reserve is working to prevent potential systemic problems by improving the nation's legal and financial infrastructure. As examples of actions taken to shore up the system, I would cite the following: strengthening the enforceability of bilateral netting arrangements; adjusting bankruptcy statutes to assist in orderly firm exit; improving payment and settlement systems; encouraging the use of same-day funds in corporate securities trades; imposing fees for daylight overdrafts, thus reducing intraday risks; and extending the hours of the Fedwire system.

Individual firms are also paying more attention to systemic risk. They are stress-testing their internal

risk management systems, to try to assess the possible effects of some of these systemic disruptions. This is a healthy sign, although it is more difficult for firms to assess this kind of risk. The recent shift in focus from the development of derivatives instruments to the management of risk in the derivatives market is a positive trend. While there has been concern that a systemic shift could disrupt the market, the argument can also be made that the use of innovative financial instruments has actually made the market more resilient.

In focusing on those institutions for which the Federal Reserve has direct oversight, the Federal Reserve is trying to ensure that these entities use sound risk management practices and that they are adequately capitalized. Strong efforts are being made to ensure that banks have in place adequate risk-based capital that reflects the type of risk they are taking on, both domestically and internationally through the Bank of International Settlements.

The Federal Reserve has issued comprehensive guidelines on risk-management practices for banks as investors in both cash securities and derivatives. These could be useful to all financial institutions utilizing these instruments and seeking to develop their own risk management systems. The guidance is simple and straightforward and addresses adequate policies and risk limits, involvement of senior management, meaningful risk management, and adequate internal controls.

The Importance of Vigilance

E. Gerald Corrigan, Chairman of Goldman Sachs International Advisors and former President of the Federal Reserve Bank of New York

The financial system is less at risk today than in the past. Institutions have gotten smarter and stronger, regulation and supervision on the whole has gotten smarter and stronger, and derivatives themselves tend to mitigate and reduce risk. Also, the probability of a financial shock shaking the system may be lower today than in the past, in part because of the risk-reducing trading of derivatives. Nevertheless, if that extremely unlikely event were to occur, its potential to cause large-scale damage is greater today than it was in the past, in part because of derivatives and the complexities and interdependencies they have introduced into the system. The stock market crash of 1987 was probably the closest thing to a large-scale financial crisis we have seen in recent

memory. But the financial market world of 1987 was a very, very simple world compared to that of 1995 and beyond.

While progress in managing, monitoring, and supervising derivatives has been considerable, much work remains to be done. In this regard, if one area were to be singled out for special attention, it would be the need to strengthen the reliability, integrity, and dependability of payments clearance and settlement systems.

If one area were to be singled out for special attention, it would be the need to strengthen the reliability, integrity, and dependability of payments clearance and settlement systems.

Reviewing recent episodes in which the use of derivatives led to a large loss, there are some common features associated with these problems. First and foremost, in almost every case, were lax controls and obvious deficiencies in managerial oversight. Other common features were excessive concentrations, doubling up on a losing bet, leverage in many forms, and a blatant reaching for an extra measure of return in a context of convincing oneself that no relationship exists between risk and return. Most interesting, many of these episodes have been associated not with instruments that I would consider exotic, but rather with the plain vanilla end of the spectrum of derivative and other new financial instruments.

The *Derivative Policy Group Report* is a set of initiatives developed as a voluntary effort by the six major U.S. securities firms at the request of Chairman Levitt of the SEC. The purpose was to develop a series of new standards and practices in four areas: management and controls, enhanced statistical reporting to the regulatory authorities, evaluation of capital in relationship to risk, and counterparty relationships.

The whole area of the nature of the responsibilities of the dealer and the end user, respectively, is particularly difficult because it may not always be mutually clear as to whether the transaction is arm's

length in the eyes of both counterparties. One way to clarify this distinction would be to have the client and dealer agree in writing whether the relationship is advisory or arm's length. As a practical matter, however, this approach would work only if it were universally adopted, and even then it would not solve all problems. Participants in the derivatives markets should not be shy about asking questions, or about telling the dealer if they believe their relationship is advisory. They should avoid transactions that they do not understand how to value, and never "bet the ranch" on anything.

We tend to forget why all this matters, whether it's plain vanilla finance or the most exotic of financial derivatives. None of it is an end in itself. The entire financial system is a means to a greater end, and that end is the way society goes about the process of mobilizing savings and putting those savings to use in the best and most efficient way, to foster economic growth and gains in living standards. We have to remind ourselves that for finance in general, but perhaps for derivatives in particular, it is unambiguously true that all market participants, big or small, sophisticated or unsophisticated, have an inherent responsibility unto themselves for discipline and prior restraint.

Dealer Efforts to Develop a Code of Conduct

*Ernest T. Patrikis, Executive Vice President,
Federal Reserve Bank of New York*

I would like to describe my work with six trade associations on "Principles and Practices for Wholesale Financial Market Transactions." The participating associations were the Emerging Markets Traders Association, the Foreign Exchange Committee of the Federal Reserve Bank of New York, the International Swaps and Derivatives Association, the New York Clearing House Association, the Public Securities Association, and the Securities Industry Association. The purpose of the project was to develop a code of conduct for wholesale over-the-counter markets, not just those relating to derivatives transactions. The principles and practices we came up with could apply across the board and not just to the wholesale markets, however.

The document, which the participants have put out for public comment, does not define the transactions it seeks to cover, because new products are appearing every day. The document also does not distinguish between dealers and end users. While

many people consider that distinction to be a valuable one, the purpose of the document was to develop best practices that could apply to all the counterparties in the over-the-counter market. These practices are not statutory or binding but represent a voluntary effort on the part of the participants. The rules address the need for firms that trade to have adequate capital and liquidity, policies and procedures that have been approved at appropriate levels, internal control and compliance, independent monitoring of risk and valuation, and periodic marking to market. If the principles and practices are adopted by a number of firms, then maybe in a year or so we will assemble another group and invite others, like the Derivatives End Users Association and the Government Finance Officers Association, to have a go at the document and see where we are. We also may send it to other countries, asking them to look at it.

VI. Summary and Conclusions

*Cathy E. Minehan, President and Chief Executive Officer,
Federal Reserve Bank of Boston*

I would like to conclude the forum with a summary of the vital elements of a successful and prudent derivatives program that the audience could take away from this day.

First, it may be useful to watch out for the temptation to regard the corporate treasury area as a profit center. Second, it is clear by now that end users have an obligation to recognize how they use derivatives, whether strategically or speculatively, and to take responsibility for the positions that they hold. A bank will probably be required by regulatory authority to demonstrate its competence here; in other situations the oversight process is less clear. But what is clear is that it may be difficult to avoid responsibility for losses that arise out of ignorance. I am reminded of a comment by Robert Baldoni, head of a derivatives consulting firm. "I invest money for my mother, who is now retired. I will invest in a variety of instruments but I won't make any investments for her the logic of which she can't repeat back to me." Perhaps this should be required of anyone involved in derivatives trading in any organization. Third, organizations should be focusing on three basic areas in controlling derivatives activities: their investment strategy as end users, their relationships with counterparties, and their internal risk management pro-

cess. In focusing on these three areas, derivative users should make sure they can comfortably answer "Yes" to the questions I have outlined at the beginning of this article.

Finally, it is clear that much of the trouble attributed to derivatives comes from the leveraging that is

either inherent in the contract itself or is used to double the bet when things start to go awry. If derivatives are used to speculate and the bet turns sour, every care should be taken to avoid the all too human tendency to throw good money after bad, using leverage.

Managing Risk in the '90s: What Should You Be Asking about Derivatives?

On April 28, 1995 the Federal Reserve Bank of Boston held a daylong educational forum entitled "Managing Risk in the '90s: What Should You Be Asking about Derivatives?" The forum, presented by experts from nonfinancial corporations, investment and commercial banks, pension funds, issuers of securities, academics, lawmakers, and government regulators, discussed important issues in the management of risk. The forum agenda is outlined below.

Keynote Speaker:

The Honorable Edward J. Markey, U.S. Congressman

What Are Derivatives and How Are They Used?

Jay Light, Professor of Finance, Harvard Business School

Panel I:

Interest Rate and Other Hedges

Moderator: Edward H. Ladd, Chairman, Standish, Ayer & Wood

Panelists: Gian Camuzzi, Senior Assistant Treasurer, The Gillette Company

Bradford H. Warner, Group Executive, Treasury, Bank of Boston

David R. Mittelman, Senior Vice President, Harvard Management

Panel II:

The Risks and Advantages of Structured Notes and Mortgage-Backed Securities

Moderator: Michael A. Jessee, President & Chief Executive Officer, Federal Home Loan Bank of Boston

Panelists: Peter Tufano, Associate Professor, Harvard Business School

William Demchak, Managing Director, Derivatives Market, J.P. Morgan Securities, Inc.

Kris Mahabir, Managing Director, AIG International Inc.

Panel III:

Risk Management and Controls

Panelists: Hal S. Scott, Professor, Harvard Law School

Robert C. Pozen, General Counsel & Managing Director, Fidelity Investments

Halsey Bullen, Project Manager, Financial Accounting Standards Board

Nathan Most, Senior Vice President, New Products Planning, American Stock Exchange

Panel IV:

Is More Regulation Necessary?

Moderator: Ernest T. Patrikis, Executive Vice President, Federal Reserve Bank of New York

Panelists: The Honorable Susan M. Phillips, Member, Board of Governors of the Federal Reserve System

E. Gerald Corrigan, Chairman, Goldman Sachs International Advisors

Perspectives on the Management of State Monies

The Honorable Joseph D. Malone, Treasurer and Receiver General, Commonwealth of Massachusetts

Wrap-Up:

Cathy E. Minehan, President and Chief Executive Officer, Federal Reserve Bank of Boston