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# PERSPECTIVE

## **Derivatives and Risk Management: Challenges and Opportunities**

*Susan M. Phillips\**

### I. INTRODUCTION

I am very pleased to have an opportunity to participate in this timely program organized by the Federal Reserve Bank of Atlanta. The conference has been focusing on issues relating to price volatility, risk management, and derivatives. These issues have been the object of intensive study and debate for several years, and there is no end in sight to this ongoing analysis.

In the next few weeks the General Accounting Office is expected to release its long-awaited study of derivatives. Several congressional committees appear poised to call hearings once the study is released. Congressman Jim Leach of Iowa, the ranking minority member of the House Banking Committee,<sup>1</sup> already has introduced legislation targeted at derivatives. His bill would create a new Federal Derivatives Commission to coordinate the regulation of derivatives activities and perhaps also to expand significantly the scope of such regulation.

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\* Member, Board of Governors of the Federal Reserve System. Her remarks were made at a Federal Reserve Bank sponsored Conference on Financial Markets on February 25, 1994 at Coconut Grove, Florida.

<sup>1</sup> As of January 4, 1995, Congressman Leach is the Chairman of the House Banking Committee.

Others in Congress reportedly are developing their own proposals for legislation in this area. The upcoming reauthorization legislation for the Commodity Futures Trading Commission (CFTC) could also focus on derivatives issues.

Both the studies and legislative proposals reflect concern and, in some quarters, alarm about the implications of the rapid growth of derivatives. This concern is focused both on risks to individual dealers and end-users, particularly federally insured banks, and on the financial stability of the system as a whole. The growth of derivatives activities undeniably poses challenges to dealers, end-users and regulators. I believe these challenges are manageable, but major efforts will be required by all involved.

As we move forward, however, we must not lose sight of the benefits of the growth and expansion of derivatives activities. The obvious benefits of the new instruments are the improved opportunities to transfer various market risks. However, the most important benefits of derivatives usually are overlooked. The complexity of derivatives activities, along with the intense scrutiny these activities have attracted, are forcing a revolution in risk management practices. The practices and techniques that must be implemented if derivatives activities are to be placed on a sound footing have the potential to significantly enhance the soundness and efficiency of more traditional trading and lending activities.

In the next few months, banking regulators will be considering the treatment of derivatives and other trading activities in regulatory capital and financial reporting standards. These rulemakings provide bankers with incentives to refine and adopt the new risk management practices that have begun to be implemented by the leading derivatives dealers. Although these rulemakings will not require any new legislation, it will require regulators to adopt new approaches to key regulatory issues.

In my remarks today I would like to more fully develop my thoughts on the revolution that is taking place in risk management and the role of derivatives in that revolution. I will then turn to some possible changes in approach to regulation and suggest how these changes could reduce the risk and enhance the efficiency of individual banks and that of the financial system as a whole.

## II. DERIVATIVES AND THE RISK MANAGEMENT REVOLUTION IN BANKING AND FINANCE

Coming from a world where risk management and hedging were part of normal business practice, I have been curious about the skepticism regarding banks' use of derivatives. I have concluded that the concerns expressed about derivatives by legislators, regulators, and even senior executives of financial institutions can best be understood as symptoms of broader anxieties about changes in financial markets and, in particular, the roles that banks are playing in those markets. During the past two decades, financial markets and institutions have changed dramatically. Markets have been transformed by the forces of securitization and globalization. Banks, especially in the United States, have seen the profitability of traditional business lines come under pressure as the result of deregulation and innovation, forcing them to develop new strategies and products in order to earn competitive returns on their capital.

As a result, the risk profiles of banks have been changing. At the largest banks, in particular, trading activities have been growing relative to traditional credit intermediation. Credit risks have declined relative to market risks. The nature of both of these types of risks has become more difficult to measure and control. Credit risks increasingly have reflected credit exposures from derivatives activities, which can range dramatically as a result of movements in interest rates, exchange rates or other market factors. Likewise, because of the greater liquidity of securities and derivatives markets and the leverage that many of these instruments offer, traders today can establish positions that entail substantial market risks within minutes or even seconds. Furthermore, the trading of options, including securities with imbedded options, creates market exposures that change rapidly due to price changes or changes in expected price volatility even in the absence of new transactions.

As a result of these changes in product mixes and risk profiles, banks and other financial institutions are required to develop new more powerful approaches to risk management. These new approaches have been made possible by advances over the past twenty years in data processing technology, and more importantly, by advances in financial economics. The publication twenty years ago of the Black-Scholes options pricing model clearly was a watershed. Since then, product innovations and theoretical innovations have fed off one another. The proliferation of derivatives has allowed the risks associated with traditional financial instruments to be unbundled and

separately priced and managed. At the same time, the offering of new generations of exotic derivatives has been facilitated by analyzing and pricing them in combinations of fundamental risk factors.

The cumulative effect of these efforts to rationalize the pricing and management of risks in the derivatives businesses of the leading banks and securities firms has been to set the stage for a revolution in risk management. This would include new approaches to the conceptualization, measurement, and control of risk. The key risk management practices and principles involved are outlined in a study that was produced by practitioners and published by the Group of Thirty last summer. Market values rather than book values are the starting point for defining and measuring risk. Risk is defined as the potential for a decline in the market value of a financial instrument or a portfolio of financial instruments. It is measured by examining historical movements in the values of fundamental risk factors and simulating the effects of such movements on the relevant market values. Heightened attention is paid to concentrations of risk and the potential for diversification that is suggested by historical correlations among risk factors. Building on this conceptual framework, risks are controlled by the consistent application of position limits based on the results of potential loss simulations. Because of the leverage and liquidity obtainable through trading derivative instruments, considerable emphasis is placed on the reliability of these internal controls, including the assumptions underlying the simulation models. They are monitored and enforced by specially trained risk managers who operate independently of the traders and report directly to senior management.

I believe that the pricing of financial instruments and the management of the component risks by these new methods have the potential to enhance the safety and soundness of financial institutions and to produce a more efficient allocation of financial risks. However, the methods involved are as complex as the derivative instruments themselves. More importantly, the systems needed to implement these methods are very costly, especially for firms that have multiple product lines and offices in numerous geographical locations. Thus, even for the largest and most sophisticated banks and securities firms, implementation of these methods poses significant challenges. Some firms that have implemented the new methods in their derivatives business have applied them only to traditional trading activities such as foreign exchange and fixed income securities. The application of modern financial methods to the pricing of loans and the management of loan portfolios is still in its infancy. Although lending is an activity

that could benefit most appreciably from application of the new risk management methods, progress has been retarded by the paucity of reliable data on market values for many types of loans. I say this based on my experience in recent years. First, I witnessed a wave of loan losses and bank failures due largely to concentrations of credit risks that were unrecognized and underpriced. Then, a period of overreaction followed, in which many credit worthy borrowers apparently could not obtain bank credit at any price.

### III. APPROPRIATE REGULATORY RESPONSES TO THE RISK MANAGEMENT REVOLUTION

The risk management revolution that has been made possible by the development and expansion of derivatives activities also poses challenges and creates opportunities for regulatory authorities. The changes that are occurring in the risk profiles of regulated entities and in their risk management practices clearly require changes in supervisory and regulatory policies and procedures. In particular, the increasing importance of market risks in the risk profiles of those large banks that are now heavily engaged in derivatives and other trading activities implies a need to review examination procedures and regulations applicable to such activities. In doing so, I believe regulators not only can meet this challenge, but also can create incentives that will place both the newer activities and the traditional activities on a sounder footing.

In my view, the on-site examination of risk management systems and internal controls always has been a critical element of banking supervision and regulation. The recent changes in risk profiles and risk management practices that I have discussed make the examination process even more important today. With derivatives and highly liquid securities, risk profiles can change drastically, not only from day to day, but from hour to hour, and from minute to minute. Consequently, regulators must devote increasing attention to the process by which banks manage their portfolios and risk profiles, as well as individual instruments that are held at any point in time.

A bank's decision-making process is embodied in the policies and procedures established by its board of directors and in the measurement systems, limit systems, audit procedures, and other internal controls that ensure compliance with the board's directives. All of these elements need to be reviewed in the course of an on-site examination of a bank. The Federal Reserve is nearing completion of a major effort to enhance and consolidate the guidance we provide to examiners

on risk management and internal controls for derivatives activities and other trading activities. Last December, the Board's staff sent a letter to examiners that highlighted the key considerations in these reviews. The Reserve Banks, in turn, distributed the letter to banks that have substantial trading or derivatives activities. These issues will also be addressed in significant detail in a Capital Markets and Trading Activities Manual that is currently being field tested by the Reserve Banks.

I would note that this guidance to examiners is broadly consistent with the risk management practices recommended by the Group of Thirty. Among the common points of emphasis are: (1) an active board and senior management oversight of trading activities; (2) the establishment of internal risk management functions that are independent of the trading function; (3) thorough and timely internal audits to identify internal control weaknesses; and (4) risk measurement and management information systems that include stress testing and contingency planning for adverse effects of unusual market conditions such as prolonged periods of market illiquidity. Although examination procedures will need to be continuously updated and strengthened, I believe that these recent efforts constitute a significant enhancement of our supervisory capabilities.

A more difficult but equally important task for regulators is the modification of capital and reporting requirements to accommodate changing risk profiles and to support implementation and ongoing refinement of the new risk management practices. Last April the Board made available for public comment proposals by the Basle Supervisors Committee to revise the Basle Accord. The revisions would recognize reductions in credit risk from the use of legally enforceable netting arrangements for derivatives contracts and would incorporate measures of market risks on foreign exchange and traded debt and equity positions including derivatives positions.

While public commentators have been supportive of the netting proposal, the market risk proposals have been heavily criticized. In the view of many large banks and trade associations, the basic problem is that the market risk proposal uses relatively simple rules that are inconsistent in some respects with modern financial economics. For example, the treatment of risks on options positions is crude and risks are aggregated in such a way that is inconsistent with statistical estimates of how those risks are correlated. As a result, the proposals fail to provide incentives for implementation and ongoing refinement of the new risk management methods. In addition, the proposed rules cannot readily incorporate new instruments, particularly those whose

value depends on new underlying assets or indexes. Finally, because of the inconsistencies between the measurement scheme embodied in the proposal and those being implemented by the leading financial institutions, compliance with the proposal would be burdensome.

As an alternative to the proposal, many commentators have suggested that banks be allowed to use their own internal models to compute capital requirements for market risk. The models would need to be made in accordance with regulatory guidelines and subject to examiner review. For example, regulators might specify that banks should set aside sufficient capital to cover 95 percent or 99 percent of potential losses on the trading positions over a two-week holding period based on historical movements in market prices over the last five years. The banks would determine the amount of capital required to meet the regulatory guidelines.

I admit that I am sympathetic to the general idea of using internal models to determine regulatory capital requirements. In fact, I strongly supported the United States banking regulatory agencies' proposal to use internal models to determine capital requirements for interest rate risk. However, I expect that ultimately, regulators will be reluctant to implement such an approach unless reliable methods can be developed for examiners to validate banks' internal models. Some commentators on the market risk proposal have flagged this issue but have not offered concrete suggestions on how to resolve it.

Financial reporting is another area in which regulators and the accounting profession need to develop new requirements that better reflect the risks and returns from derivatives and other trading activities. I think nearly everyone agrees that existing disclosures are inadequate. The practice of limiting disclosures about derivatives to notional principal amounts outstanding has even been counterproductive. It has fed unwarranted fears about the risks that derivatives activities entail. United States banking regulators have for some time required disclosure of gross replacement costs, and the Financial Accounting Standards Board (FASB) has also required disclosure of fair values and potential accounting losses associated with derivatives. Both the regulators and the FASB appear to be moving in the direction of requiring disclosure of both gross and net measures of counterparty credit exposures and also of positive and negative fair market values for various types of derivatives contracts.

These new disclosures are a step in the right direction. In particular, they should help place those scary notional principal values in perspective. These new disclosures, however, would still fall short of

providing meaningful information on risks and returns from derivatives and other trading activities. Consequently, I am afraid that such activities will continue to be misunderstood and stigmatized.

This is an area in which regulators, working with financial institutions, the accounting profession, and the academic community can and must provide leadership and vision. The Group of Thirty's analysis and recommendations on disclosure provide an excellent starting point. To be consistent with modern financial economics and to avoid stigmatizing derivatives activities, the study recommended that disclosures of trading activities apply to all financial instruments, not just derivatives. The recommended disclosures included qualitative discussions of management's attitude toward financial risks, how various instruments are used, and how risks are monitored and controlled. Although the report shows signs of a vigorous debate among practitioners on the desirability of disclosing quantitative measures of market risk, the report stopped short of recommending such disclosures.

I believe qualitative disclosures of the type recommended by the Group of Thirty would be extremely valuable. As I have discussed, we need to focus more on the process by which risks are assumed and managed rather than on the instruments held and the risks assumed at a point in time. Quantitative disclosures of risks may be misleading, especially if they represent a snapshot of an institution's risk profile. Nonetheless, I believe quantitative disclosures of market risks need to be developed and implemented based on simulations using internal models (estimates of so-called value at risk) or on the historical volatility of the market value of trading portfolios.

Judging from the Group of Thirty's report, the principal arguments against such disclosures are that they could be unreliable and may be too sensitive to reveal to competitors. Reliability clearly is a critical issue. If output from the internal models is not sufficiently reliable for public disclosure, it is questionable whether it is sufficiently reliable as a basis for regulatory capital requirements. Moreover, if market values are unreliable, the new risk management systems as a whole will have been built on a shaky foundation. With regard to the competitive sensitivity, these concerns seem overstated. The types of aggregate portfolio measures discussed in the Group of Thirty's study would tell competitors nothing about specific instruments or positions held and, therefore, would do nothing to jeopardize an institution's profits or expose it to losses. Most importantly, without disclosure of such quantitative measures, I fear that institutions with substantial de-

derivatives activities will continue to be plagued by highly exaggerated views of the risks of such activities.

#### IV. CONCLUSION

As you have heard, I believe that both financial institutions and regulators have made substantial progress in meeting the challenges posed by recent changes in financial markets and risk profiles including the expansion of derivatives activities. Nonetheless, if we are to take full advantage of opportunities to strengthen risk management practices for both derivatives and more traditional financial activities, we have more work ahead of us. Working together, I believe financial institutions and their regulators can meet these challenges. Finally, the persistence of what appear to be exaggerated fears of the risks of derivatives activities makes it essential that this work be completed expeditiously.