

For release on delivery
8 40 a m EST
February 23, 1996

Remarks by

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Chairman, Board of Governors of the Federal Reserve System

at the

Financial Markets Conference

of the

Federal Reserve Bank of Atlanta

Coral Gables, Florida

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I am pleased to participate once again in the Federal Reserve Bank of Atlanta's annual Financial Markets Conference. Now in its fifth year, this conference has earned a reputation for bringing together groups of distinguished academics, practitioners, and policymakers to discuss important policy issues. This year's program promises to enhance that reputation. The principal topic of the program is the transparency and liquidity of derivatives. More precisely, it is the implications of the relative opaqueness and illiquidity of many customized, over-the counter (OTC) derivatives for risk management, public disclosure, and relationships between counterparties. By choosing this topic, this conference distinguishes itself from the many others on derivatives and risk management. In effect, the conference focuses our attention on the challenges that lie ahead rather than on the very impressive advances that have been made in recent years.

In my remarks today I shall attempt to set the stage for the sessions that follow. I shall begin by clarifying the characteristics of OTC derivatives that determine their transparency and liquidity and that tend to make a significant portion of these instruments opaque and illiquid. Then I shall identify some of the challenges that are created by the use of opaque and illiquid financial instruments. I shall conclude by offering some suggestions on how to meet them.

Before beginning I want to emphasize that by discussing these difficulties and challenges I do not mean to call into question the benefits of OTC derivatives or the utility of the risk management techniques that derivatives dealers have developed. I would note that bank loans pose essentially the same difficulties. Like OTC derivatives, bank loans are customized, privately negotiated agreements that, despite increases in availability of price

information and in trading activity, still quite often lack transparency and liquidity. This unquestionably makes the risks of many bank loans rather difficult to quantify and to manage. Yet no one seriously questions the public benefits of bank loans, and most would agree that efforts to apply modern risk management techniques to bank loans should be supported and encouraged. Indeed, it is my hope and expectation that by addressing the challenges posed by the lack of transparency and liquidity of the more customized OTC derivatives, the way will be paved for significant and parallel advances in the management of the risks of bank loans and the many other relatively opaque and illiquid instruments.

The intermediation and unbundling of credit risks and market risks are critical functions of a financial system. These functions can be achieved only partially through standardized instruments and organized exchanges. Hence, more opaque and illiquid financial instruments serve an invaluable function in our economy. The use of such instruments entails higher risks which, of necessity, are reflected in higher intermediation costs. As advances in risk management are achieved, however, these risks and related costs can be expected to decline.

Transparency and Liquidity of OTC Derivatives and Other Financial Instruments

At the outset I should clarify what I mean by transparency and liquidity. By the transparency of a financial instrument I mean the degree of certainty with which one can determine its "fair value," which the Financial Accounting Standards Board (FASB) defines as "the amount at which the instrument could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale." Thus, fair values are a matter of conjecture.

rather than fact, they cannot be known, but must be estimated. FASB has noted that quoted market prices, when available, are the best indicators of fair values. As I shall note later, however, even quoted market prices are not always reliable indicators of the values at which transactions could be executed. Moreover, quoted market prices simply are not available for many financial instruments, despite a rapid expansion of sources of price information, such as broker screens. When quoted market prices are unavailable, fair values typically are estimated on the basis of quoted market prices for related instruments. Such estimates require assumptions about relationships between fair values of different instruments. Inaccurate or outdated assumptions inevitably heighten uncertainty about potential transactions prices.

By the liquidity of a financial instrument, I mean the percentage of its fair value that could be realized in a forced or liquidation sale. A perfectly liquid financial instrument is one whose fair value could, if necessary, be realized instantaneously. Few financial instruments, however, are perfectly liquid. For most instruments, time is required to search out a counterparty who is willing to transact at the fair value of the instrument. In general, the less time that is available to complete the transaction, the smaller is the percentage of fair value that can be realized. Also, the percentage of fair value that can be realized tends to decrease with the size of the transaction.

By these definitions, many OTC derivatives are neither highly transparent nor highly liquid. The defining characteristic of OTC derivatives is the customization of terms through private negotiations between counterparties. To be sure, broker screens provide market quotations for the more standardized or "plain vanilla" OTC

derivatives, and these account for a large portion of outstanding contracts. Even for plain vanilla derivatives, however, the estimation of fair values generally involves adjustments to market quotations to reflect operating, hedging, and other potential costs. For more customized OTC derivatives, the estimation of fair values often involves use of a mathematical model that relates fair values of the customized instruments to available market quotations for more standardized products. For example, the fair values of OTC options often are estimated using pricing models that utilize market quotations for the underlying asset and implied price volatilities from exchange-traded or plain-vanilla OTC options as inputs.

Especially for more complex options, the choice of a pricing model and of certain inputs to the model includes important elements of art as well as science. Assumptions must be made, for example, about the shape of the sampling distributions of prices and price volatilities of the underlying assets. The growing availability of independent valuation services allows users of complex instruments to assess whether or not their price estimates are consistent with other estimates. But for many instruments the range of estimates can be quite wide. Moreover, estimates are estimates. Without timely transactions prices for very similar instruments, the accuracy of the estimates remains questionable.

In principle, the value of an OTC derivative can be promptly realized either by terminating the contract or by transferring it to another counterparty. In practice, however, either procedure is likely to be time-consuming and may require the counterparty seeking to liquidate the contract to accept something less than the fair value. In either case, the prior consent of the original counterparty usually must be obtained. Counterparties typically require prior

consent for termination because termination would require them to bear the costs of replacing the terminated contract with a new contract. In general, the more customized the contract, the greater will be the cost of replacement, for which the counterparty will expect compensation. Prior consent typically is also required for a transfer, so as to protect the other counterparty against the possibility of a transfer to a less creditworthy counterparty. Although accommodating a transfer request generally would be less costly than the cost of accommodating a termination request, the counterparty may nonetheless seek compensation.

This discussion suggests that the opaqueness and illiquidity of many OTC derivatives stems from both the customization of contract terms and differences in creditworthiness across counterparties. Users of the more customized OTC derivatives, in particular, are forced to accept a trade-off between the benefits of individually tailored contract terms and credit relationships and the costs of opaqueness and illiquidity. This trade-off can perhaps be seen more clearly by comparing the benefits and costs of exchange-traded derivatives and OTC derivatives.

Exchange-traded derivatives are highly transparent and liquid, but these advantages are not achieved costlessly. The terms of contracts traded on exchanges are very standardized. In addition, credit risk is standardized by substitution of the exchange's clearing house as the central counterparty to every trade. The standardization of contract terms limits the precision with which users can manage their risk exposures. The standardization of credit risk requires the clearing house to impose costly margin requirements that are not yet routinely imposed in OTC transactions. Users of highly customized OTC derivatives evidently perceive the benefits of tailoring contract

terms and counterparty credit relationships as exceeding the costs associated with less transparency and liquidity. Otherwise they would choose more standardized contracts, either of the plain vanilla OTC or exchange-traded variety.

Over time, the terms of this trade-off between the benefits of customization of contract terms and credit relationships and the costs of opaqueness and illiquidity are likely to improve. In recent years, futures and options exchanges have successfully introduced so-called "flex" products that allow for greater tailoring of terms than traditional exchange offerings. At the same time, the use of bilateral margining agreements for OTC derivatives has been spreading. Existing proposals to create facilities for the centralized administration of such bilateral margining agreements may prove to be the first step toward the creation of clearing houses for OTC derivatives. In general, I expect that we shall see further convergence between the characteristics of OTC and exchange-traded derivatives. But I believe that it would be a mistake for policymakers to attempt to force this process. Economic forces will ensure that market participants will seek to implement exchange or clearing house arrangements if they can enhance liquidity and transparency while maintaining most of the benefits of customized contracts.

Implications for Risk Management

The development of OTC derivatives unquestionably has stimulated very significant improvements in financial risk management practices. In particular, concerns about the risks associated with use of OTC derivatives prompted the Group of Thirty to sponsor development and publication in July 1993 of a set of recommended risk

management practices that have been extremely effective in fostering improvements. Critical elements of the G-30 risk management framework are accurate assessments of the fair values of financial instruments and portfolios and the use of risk measures that presume significant portfolio liquidity. The authors of the G-30 study recognized that a series of difficulties arise in applying this framework to financial instruments that are relatively opaque and illiquid, including the more customized OTC derivatives. But the study's discussion of practices and procedures necessary to address these difficulties was rather vague. Our banking supervisors report that at the most sophisticated U.S. banks the relevant practices have been rapidly evolving but remain diverse. In part, the diversity reflects differences in risk profiles and business strategies, but varying levels of refinement also are apparent.

Opaqueness and illiquidity affect each of the critical elements of risk management--valuation, risk measurement, and risk control. The critical first step in risk management is determining the current market value of the portfolio. Earlier I noted that market quotations simply are not available for many financial instruments. I should emphasize that these include not only the more customized OTC derivatives but also thinly traded securities, as many investors in mortgage-backed securities discovered in early 1994. Values of these instruments must be estimated on the basis of market quotations for other, more standardized instruments. This requires use of mathematical or economic models that relate the values of the customized instrument to the values of more standardized instruments.

Sophisticated risk managers recognize the uncertainty and the potential for error in valuation methods for opaque instruments and seek to compensate for various sources of error by creating reserves.

Among the reserves that institutions often create are reserves for additional hedging costs, for uncertainty about the accuracy of models, especially in valuing new or especially complex products, and, quite explicitly, for illiquidity. The values of these reserves can be quite significant, especially in the aggregate. In addition, some institutions establish a credit risk reserve that is intended to incorporate credit quality into fair values. While these reserving practices can be described within a broad common framework, there appears to be no common understanding within the industry of the circumstances in which many of these reserves should be created or on their appropriate size.

Risk measurement is the assessment of potential future changes in portfolio values. Opaqueness affects the measurement of both market risk and credit risk. Consistent with the recommendations of the G-30, sophisticated managers typically measure market risk by value-at-risk ("VaR"), often defined as the amount of losses over one day that would be expected to occur only one day out of a hundred. In practice, VaR measures typically assume that the values of all instruments in a portfolio are determined by a common set of underlying risk factors--interest rates, exchange rates, commodity prices, and stock indexes--most of which are readily hedgeable. But the sensitivity of customized instruments to these factors sometimes is difficult to assess. Furthermore, the values of such instruments may be influenced importantly by risk factors other than common hedgeable factors recognized in VaR measures. One can hope that these residual risks are well diversified, but, absent a means of measuring them, this may be nothing more than wishful thinking. Unfortunately, the measurement of these risks requires accurate measures of fair

values which, by definition, are problematic in the case of opaque instruments

The difficulties in valuing some financial instruments also make accurate measurement of credit risk quite difficult. In the case of OTC derivatives, much progress has been made in modeling potential future claims on counterparties, which often are termed potential future credit exposures. However, as is the case for any financial instrument, the credit risk of an OTC derivative depends on the creditworthiness of the counterparty. If the holder seeks to transfer an OTC derivative, the amount that a transferee will be willing to pay for the contract will depend on market discount rates then applying to claims on the counterparty. Likewise, the amount that the counterparty will be willing to pay in a negotiated termination will depend on the cost at which the counterparty could replace the terminated contract, which will depend on these same future discount rates. The development of techniques for estimating potential future discount rates remains at the frontier of risk measurement. Even in the best of circumstances--in which the counterparty has issued actively traded corporate bonds--techniques extracting estimates of the relevant discount factors remain at an early stage of development.

Assessments of the liquidity of financial instruments are critical to efforts to control risks. VaR measurements often are translated into position limits for traders, which are a critical element of internal risk controls. When VaR is measured using a one-day horizon, it is implicitly assumed that risk exposures in the portfolio can, if necessary, be offset within a day. This assumption does not require that all of the financial instruments in the portfolio can be liquidated within a day. Rather, it merely assumes that the hedgeable risk exposures that are the focus of VaR measures

can be offset that quickly, presumably through use of highly liquid instruments such as exchange-traded derivatives. Still, even the most liquid markets may experience periods of illiquidity. As noted in the title of today's first session, one needs to consider the consequences if everyone can't get into the lifeboat at the same time. Furthermore, as I have suggested, the unhedgeable instrument-specific risks of illiquid instruments cannot be ignored. Losses stemming from an inability to offset or close out portfolios promptly are among the risks that sophisticated risk managers seek to assess through so-called "stress tests." However, stress testing is another area in which our bank supervisors observe considerable diversity of practice. Consensus has not yet emerged on how to identify scenarios that pose the greatest risk of loss or, as important, on appropriate responses to test results. As I have noted, some banks establish reserves to cover the potential costs of illiquidity. Others supplement VaR-based risk limits with instrument-specific position limits. In principle, stress tests could be used to evaluate the size of such reserves and limits.

Implications for Public Disclosure

The opaqueness and illiquidity of customized OTC derivatives and other financial instruments create uncertainty about the financial position and performance--the net worth, earnings, and risk profile--of users of such instruments. Concerns about such uncertainty often are termed concerns about the transparency of financial statements, a concept that is broader than the concept of transparency I have been using thus far. These concerns have prompted issuance in recent years of a series of new accounting standards and proposals by the FASB and the Securities and Exchange Commission. The most recent changes have

required disclosure of accounting policies for derivatives, of the purposes (trading or hedging) for which derivatives are used, and of fair values of derivatives, either carried on the balance sheet or in supplemental schedules. FASB has encouraged disclosures of quantitative information on market risk, and the SEC recently has proposed to require such disclosures.

I have discussed the difficulties involved in determining fair values for the more customized OTC derivatives and the diversity of valuation practices actually employed. An implication of this discussion is that market participants could better assess the financial position of users if more information were disclosed on valuation policies, including the size of the various reserves, if material, and how those reserves are determined. Fuller disclosure would reduce not only uncertainty but also the danger that reserves could be manipulated to reduce the volatility of reported earnings.

My discussion of risk measurement issues suggests that disclosure of quantitative measures of market risk, such as value-at-risk, is enlightening only when accompanied by a thorough discussion of how the risk measures were calculated and how they related to actual performance. Moreover, no single quantitative measure can summarize all aspects of such a complex concept as market risk. These conclusions are fully consistent with an analysis of appropriate public disclosures of market and credit risks (the Fisher Report) that was released in September 1994 by the Euro-currency Standing Committee of the Group of Ten central banks.

Implications for Counterparty Relationships

The opaqueness and illiquidity of some OTC derivatives also have contributed to tensions between counterparties, tensions that in some instances have produced litigation or threats of litigation. As I noted earlier, even when a market quotation is available, there may be uncertainty and confusion about what the quotation is intended to convey and how it should be interpreted. In particular, there may be confusion about whether a quotation represents an estimate of the fair market value of an instrument or a firm offer to transact in the instrument at the quoted price.

By definition, transaction prices of illiquid instruments can be different, possibly significantly different from fair market values. A fair market value is an estimate of the price at which a transaction might be executed with a willing counterparty. As I have emphasized, estimation errors are to be expected, especially for more customized, illiquid contracts. Moreover, a price concession may be necessary to produce a willing counterparty. Consequently, the price at which a transaction can be executed cannot be inferred from estimates of fair market value.

Transactions prices can be determined only by contacting potential counterparties and soliciting offers to transact. Moreover, when soliciting quotations it is essential that it be made clear to potential counterparties that a transactions price, rather than a fair market value estimate or a nonbinding "indicative" price quotation is desired. Likewise, counterparties that receive requests for quotations should determine clearly what type of quotation is desired before responding.

Addressing the Challenges Posed by Opaqueness and Illiquidity

Before concluding, I would like to offer a few brief suggestions for addressing the challenges I have identified. On the risk management front, there should be more public discussion of valuation difficulties and best practices for addressing those difficulties. This would appear to be an area in which an industry initiative by derivatives dealers or by accounting or consulting firms would be quite useful. Regarding public disclosure, I remain convinced of the usefulness of the central recommendation of the aforementioned Fisher Report, which called for financial intermediaries to move in the direction of disclosing to the public the quantitative measures of market risk and credit risk that the firm's management relies upon. A November 1995 review by the Basle Supervisors Committee and the Technical Committee of IOSCO found that internationally active banks and securities firms had made progress in implementing the Fisher Report's recommendations, but the Report also concluded that further efforts were needed by intermediaries in many G-10 countries. Finally, I believe the problems that opaqueness can create for counterparty relationships can best be addressed by heightening awareness of potential ambiguities associated with market quotations and encouraging clarity in communications between counterparties. The initiative on valuation that I have suggested would clearly contribute to an understanding of the differences between fair value estimates and transactions prices.

Conclusion

In my remarks today I have tried to identify the challenges posed by the opaqueness and illiquidity of some OTC derivatives and of many other financial instruments as well. I have done so on the assumption that the long debate on derivatives has reached a stage of maturity at which we can openly discuss difficulties and challenges without running the risk of a legislative or regulatory overreaction. In any event, I am confident that, in the long run, frank discussions like those that I expect to take place at this conference offer the most effective hedge against that risk.