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Remarks by
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The final decades of the twentieth century witnessed remarkable advances in financial engineering, financial innovation, and deregulation. As recently as thirty-five years ago, the universe of financial instruments was composed almost exclusively of deposits, short- and long-term, plain vanilla debt, and equities. Financial institutions, by and large, specialized in relatively narrow portions of these markets. In the intervening years, significant developments in technology and in the pricing of assets have enabled innovations in financial instruments that allow risks to be separated and reallocated to the parties most willing and able to bear them and the degree of specialization by financial intermediaries changed dramatically. In the case of debt instruments, investors may now choose among structured notes, syndicated loans, coupon STRIPs, and bonds secured by pools of other debt instruments. But of all the changes we have observed in the past three decades, two of the most dramatic have been the growing use of financial derivatives and the increasing presence of banks in private equity markets. Today I should like to evaluate the scope of these latter progressions, the risks they entail, and some of the challenges in managing those risks.

It seems undeniable that in recent years the rate of financial innovation has quickened. Many in fact argue that the pace of innovation will increase yet further in the next few years as financial markets increasingly intertwine and facilitate the integration of the new technologies into the world economy. As we stand at the dawn of the twenty-first century, the possible configurations of products and services offered by financial institutions appear limitless. There can be little doubt that these evolving changes in the financial landscape are providing net benefits for the large majority of the American people. The rising share of financial services in the nation's national income in recent years is a measure of the contribution of the newer financial innovations to America's accelerated economic growth. Derivatives and private

equities have been in the forefront of the recent financial expansion, fostering the financing of a wider range of activities more efficiently and with improved management and control of the associated risks

Fear of Change

Nonetheless, some find these developments worrisome or even deeply troubling. The rapid growth and increasing importance of derivative instruments in the risk profile of many large banks has been a particular concern. Yet large losses on over-the-counter derivatives have been few. Derivatives possibly intensified the losses in underlying markets in the liquidity crisis during the third quarter of 1998, but they were scarcely the major players. Credit losses on derivatives spiked but remained well below those experienced on banks' loan portfolios in that episode.

Derivatives credit exposures, as you all know, are quite small relative to credit exposures in traditional assets, such as banks' loans. In the fourth quarter of last year, for example, banks charged off \$141 million of credit losses from derivatives—including options, swaps, futures, and forwards—or only 0.04 percent of their total credit exposure from derivatives. This in part reflects the fact that in some derivative contracts, most notably in interest rate swaps, there is no principal to be exchanged and thus no principal at risk. In comparison, net charge-offs relative to loans were 0.58 percent in that quarter—also small but, nonetheless, almost fifteen times as much. In the third quarter of 1998, at the height of the recent financial turmoil, the loan charge-off rate at U.S. banks was 4½ times that of derivatives.

In a similar vein, concerns of highly leveraged positions caused by derivatives have led to fears of “excessive leverage.” But leverage, at least as traditionally measured, is not a

particularly useful concept for gauging risk from derivatives. A firm might acquire an interest rate cap, for example, to hedge future interest rate uncertainty and hence to reduce its risk profile. Yet if the cap is financed through debt, measured leverage increases. Thus, although one may harbor concerns about the overall capital adequacy of banks and other participants in derivatives markets and their degree of leverage, the advent of derivatives appears to make measures of leverage more difficult to interpret but not *necessarily* more risky. To be sure, the unfamiliar complexity of some new financial instruments and new activities, or the extent to which they facilitate other kinds of risk-taking, cannot be readily dismissed even by those of us who view the remarkable expansion of finance in recent years as a significant net benefit.

What I suspect gives particular comfort to those of us most involved with the heightened complexity of modern finance is the impressive role private market discipline plays in these markets. Importantly, derivatives dealers have found that they must maintain strong credit ratings to participate in the market. Participants are simply unwilling to accept counterparty credit exposures to those with low ratings. Besides requiring a strong capital base and high credit ratings, counterparties in recent years have increasingly insisted both on netting of exposures and on daily posting of collateral against credit exposures. U.S. dealers, in particular, have rapidly expanded their use of collateral to mitigate counterparty credit risks. In these programs, counterparties typically agree that, if exposures change over time and one party comes to represent a credit risk to the other, the party posing the credit risk will post collateral to cover some (or all) of the exposure. These programs offer market participants a powerful tool for helping control credit risk, although their use does, as we all know, pose significant legal and operational issues.

Legitimate Concerns

Despite the commendable historical loss record and effective market discipline, there are undoubtedly legitimate concerns and avenues for significant improvement of risk management practices. Moreover, during the recent phenomenal growth of the derivatives market, no significant downturn has occurred in the overall economy to test the resilience of derivatives markets and participants' tools for managing risk. The possibility that market participants are developing a degree of complacency or a feeling that technology has inoculated them against market turbulence is admittedly somewhat disquieting.

Such complacency is not justified. In estimating necessary levels of risk capital, the primary concern should be to address those disturbances that occasionally do stress institutional solvency—the negative tail of the loss distribution that is so central to modern risk management. As such, the incorporation of stress scenarios into formal risk modeling would seem to be of first-order importance. However, the incipient art of stress testing has yet to find formalization and uniformity across banks and securities dealers. At present most banks pick a small number of *ad hoc* scenarios as their stress tests. And although the results of the stress tests may be given to management, they are, to my knowledge, never entered into the formal risk modeling process.

Additional concern derives from the fact that some forms of risk that we understand to be important, such as liquidity and operational risk, cannot at present be precisely quantified, and some participants do not quantify them at all, effectively assuming them to be zero. Similarly, the present practice of modeling market risk separately from credit risk, a simplification made for expediency, is certainly questionable in times of extraordinary market stress. Under extreme conditions, discontinuous jumps in market valuations raise the specter of insolvency, and market

risk becomes indistinct from credit risk

Of course, at root, effective risk management lies in evaluating the risk models upon which capital allocations and economic decisions are made. Regardless of the resources and effort a bank puts into forecasting its risk profile, it ought not make crucial capital allocation decisions based on those forecasts until their accuracy has been appraised. Yet forecast evaluation, or “backtesting,” procedures to date have received surprisingly little attention in both academic circles and private industry.

Quite apart from complacency over risk-modeling systems, we must be careful not to foster an expectation that policymakers will ultimately solve all serious potential problems and disruptions. Such a conviction could lull financial institutions into believing that all severe episodes will be handled by their central bank and hence that their own risk-management systems need not be relied upon. Thus, over-reliance on public policy could lead to destabilizing behavior by market participants that would not otherwise be observed—what economists call moral hazard.

There are many that hold the misperception that some American financial institutions are too big to fail. I can certainly envision that in times of crisis the financial implosion of a large intermediary could exacerbate the situation. Accordingly, the monetary and supervisory authorities would doubtless endeavor to manage an orderly liquidation of the failed entity, including the unwinding of its positions. But shareholders would not be protected, and I would anticipate appropriate discounts or “haircuts” for other than federally guaranteed liabilities.

As we consider potential shortcomings in risk management against the backdrop of an absence of significant credit losses in derivatives, one is compelled to ask: Has the financial

system become more stable, or has it simply not been tested?

Probability distributions estimated largely, or exclusively, over cycles that do not include periods of financial stress will underestimate the likelihood of extreme price movements because they fail to capture a secondary peak at the extreme negative tail that reflects the probability of the occurrence of extreme losses. Further, because the experience during crises indicates heightened correlations of price movements, joint distributions estimated over periods that do not include severe turbulence would inaccurately estimate correlations between asset returns *during* such episodes. The benefits of diversification will accordingly be overestimated.

Another aspect of the system that may not have been appropriately tested is the set of credit risk modeling systems that have evolved alongside the growth in derivatives. Such models embody procedures for gauging potential future exposure. Prevailing prices will doubtless change in the future, so counterparties must assess whether those contracts with small or even negative current values now have the *potential* to result in large positive market values and, hence, a potential credit loss on default. Do such calculations adequately account for the possibility of prolonged disruptions or recessions? Are assumptions relating exposures to default probabilities sufficiently inclusive? These and other support columns underlying estimation of potential future exposure should continue to be examined under a critical light.

Private Equity Activity

Derivatives, no doubt reflecting their growth, their extensive use in hedging that facilitates additional risk-taking, and their gigantic notional values, continue to be the quintessential image of financial engineering and innovation. But another dramatic change in the activities of banking organizations has received less attention: merchant banking. Indeed, the

most dramatic change in the financial landscape that the Gramm-Leach-Bliley Act may have induced is not the combination of banking, securities underwriting, and insurance, but rather the *generalized merchant banking powers for financial holding companies*. And even this change is really evolutionary for a handful of very large U S banking organizations.

By merchant banking, I mean financial equity investment in nonfinancial firms, most often, but not always, in nonpublic companies, with the investor providing both capital and financial expertise to the portfolio company. Such investments are usually held for three to five, but often as long as ten or more, years for subsequent resale to other investors. The recent financial modernization legislation gives banking organizations broad authority to make merchant banking investments but prohibits them from routinely managing the portfolio companies in which they have invested except in extraordinary circumstances for limited periods. In addition, banks' credit extensions to the firms in which their parents or affiliates hold equity are limited by the same section 23 A and B restrictions imposed on bank lending to their affiliates.

Prior to the recent legislation, banking organizations could make only limited types of merchant banking investments, and these were made principally through three vehicles. First, since the late 1950s, banks and bank holding companies have been authorized to operate small business investment companies (SBICs) that can invest in up to half of the equity of an individual *small business*, currently defined by regulation as one with less than about \$20 million of pre-investment capital. The aggregate limit of such investments cannot exceed 5 percent of the bank or BHC's capital. Second, Edge corporations, which are primarily subsidiaries of banks but can also be subsidiaries of holding companies, can acquire up to 20 percent of the voting

equity and 40 percent of the total equity of nonfinancial companies *outside the United States*. Finally, BHCs more generally can acquire up to 5 percent of the voting shares and up to 25 percent of the total equity of *any* company without aggregate limit. I have, of course, been referring to equity investments of banking organizations for their own account. BHC's section 20s—and any future investment banking affiliates—also hold equities in trading accounts as part of their underwriting and trading activities. These daily mark-to-market holdings are quite large at a couple of banking organizations that have a significant equity underwriting business but are rather modest for others.

Through the three long-term holding vehicles, banking organizations have made direct equity investments on their own and in partnership with others. They have also made indirect investments through private investment groups, sometimes acting as the manager of the group for performance-based fees. In the early 1960s, banking organizations were probably the dominant source of venture capital in the United States, and still play an important role—perhaps accounting currently for 10 to 15 percent of the domestic private equity market. What has changed with the recent legislation is the generalized grant of authority for bank holding companies that qualify as financial holding companies to exercise merchant banking powers. There are now about 155 domestic and more than 10 foreign financial holding companies that could—but not necessarily will—undertake merchant banking. Two-thirds of the financial holding companies have less than \$500 million in assets, about one-third have less than \$150 million.

In evaluating that general grant of merchant banking authority, it is useful to consider the experience of banking organizations that have been active participants in the private equity

market in recent decades. To date, there have been no significant problems. To be sure, the record on private equity investment by banks is one of substantial year-to-year variation in return, just as one might expect with any portfolio of risky assets. Some of the deals have resulted in total write-offs, but over all the rates of return, especially in recent years, have been quite impressive—30 percent or so per year in the last five years. In part, perhaps in large part, this reflects the substantial rise in equity prices.

Still another historical factor has been the quite conservative treatment of equity portfolios by banking organizations. Both banks and independent securities firms engaging in merchant banking have tended to allocate substantial *internal* capital to support their private equity investment activity—between 50 and 100 percent—and to recognize unrealized capital gains only on traded equities or when some triggering event supported the revaluation of nontraded shares and then only subject to a discount. In effect, banks have locked up significant internal capital for their equity purchases and have been conservative in recognizing gains in their earning flows and, consequently, in their capital.

For a small number of large banking organizations, equity portfolios are a significant share of their business already. As of year-end 1999, for the five large banking organizations with more than one billion dollars invested, at cost, in equities, these assets accounted for between approximately 10 percent and 25 percent and more of tier-1 capital and between more than 10 percent and 35 percent at carrying value. Moreover, the pre-tax gains recognized last year—either at sale or because of revaluation—accounted for between 5 and 30 percent of pre-tax reported earnings in 1999 at these five banking organizations. In the first quarter of this year, such gains accounted for 16 percent to more than one-half of pre-tax income.

It is likely that authorization of merchant banking powers will lead both to deeper participation by the current large players and to wider merchant banking activity across banking organizations. To limit risks to the bank subsidiary of the financial holding companies and to the insurance fund, the Federal Reserve interim regulations require that before this activity commences, the organizations establish appropriate internal controls to manage the risks associated with this activity. It must be kept in mind, as I pointed out in other contexts, that most bad commercial loans are made during prolonged periods of prosperity. I suspect that the experience of bank equity investment has been similar. Current interim regulations—which propose for comment a 50 percent capital charge on all nontrade account equities held by banking organizations—should not be viewed separately from the current state of the economy any more than commercial banking should be.

In any event, at those entities with significant merchant banking portfolios, the above average variance in stock prices will doubtless add to the variability of earnings of the overall organization—and hence, one can conclude, to the organization's valuation in the marketplace. There is, indeed, general agreement that the price-earnings ratio of trading banks is lower than that of other banks of the same size, although it has been difficult because of the dynamics of other variables to nail down empirically the appropriate orders of magnitude. And, I suspect, that if the data were readily available, we might be able to demonstrate the same pattern at institutions significantly involved in the private equity market and perhaps even in derivatives trading. Any earnings stream that shows variability has been appropriately discounted. That is not to say that real economic value is not being created for banking organizations, their shareholders, and the economy from what appears to be a greater—and perhaps expanding—flow

of venture and other equity capital from banking organizations. But despite the very good record to date in both the derivatives and private equity activities of banking organizations, we all would be remiss if we did not note that there are risks in these activities that, during some periods in the future, will create reduced returns, if not significant overall losses, for individual organizations. However, the same might be said about portfolios of loans—the traditional historical major asset of banks—and one that will continue to dominate the business of most banks for the foreseeable future.

Conclusion

I have noted many times over the years that the purpose of banks and banking organizations is to take risk in order to contribute to, and facilitate the growth, and other needs, of an economy. We must be cautious, however, that we understand the nature of the new risks that have evolved with information innovation technologies and be certain that they are managed in ways that do not undermine this economic role.

Balancing these objectives is no easy task. We need to ensure that strong risk-management systems are in place and that the management of banking organizations use these systems both to enhance their awareness and understanding of the risks *knowingly* taken and to manage those risks accordingly. But systems are never perfect, mistakes will be made, and tails in loss distributions do represent a reality that sooner or later occurs.

Individual foreign and domestic banking organizations in the past have, from time to time, suffered large losses in the derivatives and private equity markets. We will not be immune from such events in the future. But so long as we recognize the risks and insist on good risk-management system, and so long as supervision moves—as it has—from balance sheet analysis

to a review, evaluation, and criticism of risk management systems, economic growth is, I suggest, enhanced by the kinds of financial innovation that technology and deregulation are now producing

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