

SPECIALIZATION IN RISK MANAGEMENT
Supervision of Derivative Instruments

by

Jerry L. Jordan
President and Chief Executive Officer
Federal Reserve Bank of Cleveland

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PO Box 6387
CLEVELAND
OH 44101

Specialization in Risk Management* Supervision of Derivative Instruments

The financial press in the United States is having a great time this year telling readers about the risks associated with financial derivatives. The casual reader might think that some new risks have been invented, or, at a minimum, that our financial system is riskier now than a few years ago. Neither conjecture is true. New risks have not been discovered, and the financial market is not a riskier place.

Nor is it true that an overriding policy priority today is the need for new legislation or new regulation to deal with derivatives. I realize that some people view the modern financial system as a house of cards that remains standing only when buttressed by wise regulation and other government interventions. Naturally, these people view financial innovations like derivatives as potentially destabilizing challenges to policymakers and regulators.

My own view is that financial innovation tends to be inherently stabilizing, not destabilizing. For those many of us who view modern financial systems -- and, for that matter, market economies based on private property and price systems -- as inherently resilient, financial innovations are welcomed as reinforcements of the natural discipline and stabilizing forces at work in a market economy.¹

Using derivatives to deconstruct risk into new categories does not create more risk. The revised risk catalogue, including systemic risk, credit risk, counterparty risk, settlement risk, Herstatt risk, market risk, legal risk, and operating or management risk, seems thicker, I know. For market experts, such terms as delta risk, gamma risk, convexity risk, and volatility risk, have become common. The naive conclusion seems to be that increasing the number of categories means increasing the amount of risk, and that

* The writings of my Federal Reserve colleagues Alan Greenspan, John LaWare, William McDonough, Susan Phillips, and Peter A. Abken have been particularly useful in preparing this paper. Members of the staff of the Federal Reserve Bank of Cleveland, in particular Ed Stevens, have contributed significantly to the paper.

¹ I have set forth elsewhere (Jordan, 1994) the view that organizations and institutional arrangements that strengthen property rights and the role of prices in allocating productive resources are enduring and wealth enhancing.

legislators and regulators should be mounting a counteroffensive.

The Congressional hearings on derivative instruments this past spring reminded me of my paternal grandmother, raising a family in rural Texas about 70 years ago.

Apparently, my father and my uncle were what you might call “adept at finding innovative ways of entertaining themselves.” Recognizing this, my grandmother frequently would say to one of their older sisters, “Go find out what the boys are doing, and tell them to stop it!”

I detect a similar tendency among well-intentioned legislators, who want to say “Stop it!” as soon as they see that some participant has lost a bundle of money using financial derivatives. Such a reaction stems from the idea that market participants are propelling the financial system and the deposit insurance system into more risk. What needs to be understood is that we are seeing innovations in risk *management*, not innovations in risk itself. The underlying positions of participants always involve substantial risk, and there is substantial risk in any business endeavor. Innovations in risk management should be welcomed, as when wheat farmers first learned to lock in the price they would get for the current crop through the use of futures contracts.

In my remarks today, I want to make the following points:

- (1) Risk exists because there is uncertainty in the world. Successful innovations in risk management, such as derivative instruments, do not make financial markets riskier.
- (2) Increased specialization in the management of risks improves the functioning of markets; resource allocations will be wealth enhancing as comparative advantages evolve in identifying and managing risks.
- (3) Supervision of financial activity can strengthen the ultimate discipline coming from the marketplace; regulation of financial activity in a global environment can have unintended consequences by forcing activity out of natural channels and by socializing risk.

Specialization and Risk

People often say they want to “reduce risk,” “minimize risk,” “eliminate risk,” or “avoid risk.” Such language suggests that risk is something undesirable, as it is for most people. However, individuals shed risk largely by passing it along to someone else. For

the system as a whole, risk is unchanged--it is simply borne by someone else. This 'someone' may be a specialist who is better equipped to manage it or, in the case of public policy, a citizenry that may or may not be aware that a risk has been socialized.

I find it helpful to think of financial innovations like derivatives in the context of Frank H. Knight's distinction between "uncertainty" and "risk," developed in his classic 1921 book, Risk, Uncertainty, and Profit.² At the heart of his analysis was a distinction between *uncertain* situations, in which the probabilities of possible outcomes simply are unknown, and *risk* situations, in which the probability distribution of potential outcomes of an event is known.

Following Knight's usage, entrepreneurs are specialists who use their expertise to transform genuine uncertainty about future events into risk -- that is, from less-well-specified into better-specified distributions of potential outcomes. Specialization allows entrepreneurs to calculate expected values as a basis for cost estimates, supply decisions, and market clearing prices. For example, farmers and bakers use the wheat futures market as the production technology for transforming uncertainty about the market price of wheat at harvest time into a known price and risky return when wheat is planted and when bread marketing and distribution arrangements are made. Bankers and insurance companies, as well as bond and stock mutual fund managers, use specialized knowledge and access to information, supplemented by the law of large numbers, as their production technology in transforming uncertainty about the outcome of unique business ventures into a risky return on a portfolio of assets.

Physicists say that matter can be neither created nor destroyed, but its form can be converted from solid to liquid to gas. Something similar can be said of uncertainty -- it exists in nature and it can take a variety of forms. General uncertainty can be segmented into identifiable risks that, in turn, can be transformed into alternative forms. For example, interest rate risk can be converted into credit risk. Risk can be transferred from one party to another. Specific risks can be decomposed into component parts, allowing types of risk to be segmented or combined. And, risk can be "managed."

² Knight (1971 [1921]).

Financial risk management has been evolving for centuries. For most of this time, the pace of evolution was gradual. With the coming of the industrial revolution, however, economic development was accompanied by financial development, reflecting more rapid accumulation of innovations in financial contracts, institutions, and markets. One index of financial development is the intermediation ratio, measuring the layering of wealth owners' claims on intermediaries, atop intermediaries' claims on borrowers, atop borrowers' claims to real capital. The seeming redundancy of claims was productive because banks, insurance companies, and other types of intermediaries each developed innovations, through unique specializations, that allowed them to make a profit while assuming risk and offering wealth owners a more assured return.

More recently, communications technology and computing power have changed the financial development process. Increasingly, derivative financial instruments allow risk to be transferred and better managed without adding new layers of intermediary claims atop the underlying real capital stock. Redistributing risk from less to more efficient specialists means, in general, moving toward a more efficient allocation of risk-bearing resources. Wealth is enhanced because, despite the trepidation of savers about interest rate risk, for example, more houses are built as more mortgages are packaged into collateralized mortgage obligations and sold in the global capital market. As a result, less of something else may be built, but the world is a better place because markets have used the new financial technology to offer savers a higher return per unit of risk, and consumers a lower cost of consumption per unit of risk.

After all, if wealth were not being enhanced, why would anyone use the new technology? Two parties will enter into a contract only because each thereby realizes an increase in the present value of wealth. One party increases its present value by assuming a risk for which its specialization makes it fitted. The other party increases its present value by shedding that risk in return for a fee, or in return for a risk that is more congenial to its own specialization. Events are basically unchanged (ignoring, for the moment, any negative externalities and any feedback of efficiency on growth), but resources are allocated more efficiently. Old techniques for transforming uncertainty into manageable

risks are pushed aside as new specialists penetrate more broadly and deeply into the market. The cost of risk-bearing falls for society, thereby enhancing wealth.

Derivative Financial Instruments

“Credit risk” management was the focus of attention in commercial banking in the 1980s. That followed a period in which “interest rate risk” and “country risk” were the hot topics. Now, financial engineers are altering the financial intermediary process, using finance theory and computer technology to divide risk into components that heretofore were inseparable from underlying assets. Beyond that, globalization of financial markets prevents anyone from monopolizing the benefits of derivatives, just as it cuts through monopoly and regulatory specializations based on old technology.

Financial derivatives were being used long before the 1970s, when organized exchange trading began. Thereafter, most derivative financial contracts were traded on the organized commodities exchanges, so that holders of contracts were protected by the exchanges themselves, as well as by Securities and Exchange Commission (SEC) rules. The exchanges, as the counterparty to each contract traded, had a clear self-interest in promoting integrity of trading and delivery, and that remains the approach to supervision of exchange-traded derivative contracts today. The nature of contracts, however, has expanded to include a wide variety of options indexed to financial-market measures like stock market price indicators and even the monthly average overnight federal funds rate.

The most rapidly growing instruments in the derivatives market, and the locus of recent innovation, are over-the-counter (OTC) contracts. These are outside the purview of any exchange rules. They include ordinary currency and (largely) interest rate swaps, plus a small portion in more exotic hybrid contracts. Typically, one or more of the counterparties to an OTC contract is a commercial bank, with the contract tailored to the idiosyncratic needs of the counterparties, much like a commercial loan. Most banks say they enter into contracts simply as end users, to meet their own risk management needs. A dozen or so of the largest money center banks, however, are counterparties to a very large percentage of all OTC contracts because they act as dealers, tailoring contracts to

the needs of any customer. These banks must manage the net risk that results from their dealer position, earning their income from a bid-ask spread.

Any user of derivative contracts, whether a dealer or end-user, should be able to demonstrate to management, directors, auditors, and shareholders, qualitatively, if not quantitatively, the rationale for positions taken. This does not mean that all derivative positions can be designated as either a hedge or a speculation, because derivative contracts are not ordinarily isolated in a separate profit center.

Even a derivatives dealer will not necessarily try to run a riskless book of offsetting derivatives exposures, but instead may want to use its dealer position to offset a risk exposure elsewhere on its books. For end users as well as dealers, derivatives must be part of a larger risk-management strategy. Current accounting practices, of course, do not produce an integrated record of risk management. This is why some supposed losses from derivatives are not losses at all, but simply the offset to gains elsewhere in the business. Offsetting the gains and losses leaves the neutral position the firm was trying to ensure by off-loading certain types of risk. References to a firm's derivatives business as an actual or intended profit center, on the other hand, suggests an intention to do more than contribute an ingredient to risk management, perhaps by arbitraging some market niche, or simply by engaging in informed speculation.

Supervision and Regulation

Derivatives are innovations that, like atomic energy and genetic engineering, can be used for good or ill, and be intended for good but have ill effects through mismanagement. An objective of government supervision is to ensure that innovation takes place in an open environment, so that those affected can see how innovations are being used and to what effect. Supervision in this sense stands in contrast to regulation, by which government seeks to ensure good results by directing or delimiting the actions of citizens³. The beauty of a market economy is that innovations like derivatives can be

³ For discussion and recommendations for strengthening the disciplining role of market forces through appropriate supervision and regulation, see Jordan (1993).

expected to have good results, as the invisible hand of the market mediates among the self interests of potential users, preventing unintended gains and losses over time by driving the inept from the marketplace. This simple Smithian economic theory, however, seems at variance with the publicity being given to some spectacularly large losses attributed to derivatives activity in recent years. Current proposals to regulate derivatives are, at least in part, a reaction to those losses.

One reason for losses undoubtedly is inexperience with the new engineering of risk. Both experience and theory make good teachers and the experience with derivatives has been teaching some valuable (or at least expensive) lessons. Some of these lessons have been more like refresher courses, such as the notions that interest rates are not a one-way bet, that leveraging a position leverages risk, and that undersupervised pockets of a large organization are bound to invite agency problems. Other lessons seem dumbfoundingly simple only with hindsight, like the fact that valuations of a derivatives position can be extremely sensitive to overlooked or untested assumptions about things like liquidity and cross correlations among asset returns.

Three additional important lessons are largely overlooked in the media. One is that derivatives redistribute risk from one counterparty to the other. This means that the counterparties to spectacular losers have been some substantial gainers who probably will be unable to continue laying off risk on as favorable terms in the future as in the past. A second lesson is that the recent spate of spectacular losses has been associated, for the most part, with so-called "exotic" derivatives that comprise only a very small fraction of the market. Of course, "plain vanilla" OTC currency and interest rate swaps and futures can have very long maturities, so experience to date is not necessarily the whole story there. A third lesson is about the usefulness of capital in paying for an education. All but a slight fraction of losses on derivatives contracts *to date* have been absorbed from the capital of the exposed party, its parent, or its sponsor, and *not* from any haircut on the value of the contract to the party "in the money."

Market discipline can be a powerful educator, as long as the experience of both the gains and the losses from using derivatives remains with the contracting parties. Moreover, the potential for gain and loss provides the incentive for concerted action to

change the infrastructure of markets. Law, accounting, and standard market practices devised in the past need updating to cover the new derivative instruments. The 1993 recommendations of the Group of Thirty are one recent example of the self-interest of the participants in the OTC derivatives market seeking the basis for more reliable evaluations of risks.

Government can help in strengthening institutional arrangements that promote market discipline. For example, markets operate best with reliable information, but most observers agree that reliable information is not yet consistently available about derivatives and derivatives positions. Supervisory authorities such as central banks are in a position to help market participants develop common forms of disclosure, even by such simple procedures, in the United States, as releasing CAMEL and BOPEC ratings.⁴

“Better information” actually covers a wide range of possibilities where supervisors and participants have common interests. One opportunity for improvement is communication internal to a firm. Because banks are the dominant institutions in the OTC derivatives market, the existing bank examination process can serve as a useful check on some seemingly obvious, but sometimes overlooked, matters where advice can substitute for painful experience. Supervisory authorities can ensure that fundamental questions are being addressed. Is a bank’s strategy to be only an end user, or also a dealer in derivatives? Do staff, top management, and directors all have the same understanding of the bank’s derivatives strategy? How consistently is that strategy being communicated to shareholders and the public?

Another aspect of information where the interests of supervisory authorities and market participants converge is in maintaining objective measures of risk for reliable interbank comparisons. Inclusive evaluations of management capability, based on something like the rating systems we use in the United States, are suitable for this function. Basle risk-based capital standards represent significant progress toward establishing global interbank comparability.

⁴ CAMEL and BOPEC are acronyms for the factors underlying regulatory risk ratings used for banks (capital, asset quality, management, earnings, and liquidity) and bank holding companies (bank, other subsidiaries, parent company, earnings, and capital).

An obvious next step, already taken by the Basle Committee, will be to incorporate off-balance-sheet risks into firm-specific capital adequacy measures. The federal banking supervisors in the United States have such a proposal out for comment at the moment. In the case of exchange-traded contracts, of course, risk is not so contentious an issue. Daily marking-to-market and margin requirements protect the exchange, while the strength of the exchange protects the in-the-money counterparty. OTC derivatives, in contrast, cannot be marked to market directly, so another method of monitoring exposures must be developed.

As the bank examination process evolves, I expect that the risk management of derivative instruments used or offered by a bank will employ firm-specific stress testing of the bank's capital adequacy. This will require a valuation model for OTC derivatives that includes consideration of duration, counterparty concentrations, and liquidity. Development of the appropriate simulation model should be left to the firm, but it must be a well documented, comprehensive representation of its exposures, and must also be flexible about the range of stress assumptions under which the model can be simulated. The advantage of a mutual market and supervisory interest in folding off-balance-sheet risk into capital adequacy is that supervisors will have the benefit of comparing many different methods, and of requiring answers to challenging questions.

Not all proposals for government action in the derivatives market are as benign as seeking better information. As a general rule, it is wiser to let market forces mete out losses as well as profits, than to force everyone to follow suboptimal rules and socialize losses. Perhaps the initial educational role of government supervision and examination will dwindle in importance over time. Certainly there can be no permanent detailed direction of derivative practices from supervisory personnel whose technical expertise, while substantial, cannot be expected to match that of market players. Nonetheless, there is a crucial role for oversight by the chartering authority or, more significantly, the provider of deposit insurance, in protecting the public trust and the public purse.⁵ In Ronald Reagan's phrase about arms control, "Trust, but verify."

⁵ For a more detailed discussion of the roles of public authorities in supervision and regulation, see Jordan (1993).

Systemic Risk

Financial innovations in general, and derivative financial instruments in particular, may represent nothing more than new specializations being used to manage risk more efficiently. Like Adam Smith's pin maker, new risk specializations should increase economic efficiency and human well-being, as its benefits are realized through market trading. This assumes, however, that financial innovations have no negative externalities detracting from the benefits of the rapid spread of new financial technologies -- that is, that the marginal private and social costs of risk bearing are identical.

There appears to be widespread apprehension that the social costs of derivatives exceed their private costs. Unrecognized in private cost, apparently, is the systemic aspect of potential market collapse, reflecting new interdependencies generated by derivatives, among counterparties, risks, and markets.

Of course, for as long as counterparties have had counterparties, credit risk has had an element of interdependence -- one party's repayment of debt to another was a function of someone else's ability to repay a debt to the first party. These interdependencies have been modeled according to three unique sources of potential difficulty. Two of these -- manias and fragility -- are viewed in much the same way today as they were by Walter Bagehot in 1870, in Lombard Street. The third, systemic risk, is a newer and still fuzzy concept of uncertain significance.

Manias and bubbles, including their consequent panics are one model of interdependence among market participants. This model recognizes that economic agents have a propensity for delusion about the return on particular investments, as a mass of investors mutually support each other's belief -- first, in the impossible and then, in the inevitable. Their common delusion is a misreading either of the likely real return to capital, or of the probability of cashing in a position before anyone else does. Walter Bagehot described the phenomenon as when owners of savings "find that ...specious investments can be disposed of at a high profit, they rush into them more and more....So long as such sales can be effected the mania continues; when it ceases to be possible to effect them, ruin begins."⁶ In modern jargon, this is known as "the bigger fool theory." A

⁶ Bagehot (1921), pp. 131-132.

recent example was when the Nikkei average went to 40,000. Another is the popularity of the MMM enterprise in Russia, despite government warnings that it is nothing more than a Ponzi scheme.

The explosive growth of OTC derivatives contracts conceivably could be classified as a temporary mania, particularly from the point of view of those whose mismanagement has produced spectacular losses. With hindsight, marginal private cost was apparently seriously underestimated. Continued rapid growth of derivatives contracts at the pace of the past several years certainly would begin to raise the mania flag. Even in a global financial marketplace there must exist a finite limit to shiftable risk. For now, however, that point does not seem to be in sight.

The second model based on interdependence is *fragility*, in the technical sense used by writers like Hyman Minsky. The fragility model produces debt/equity ratios that are higher than is socially efficient, and that rise as an economic expansion proceeds. Again, harking back to Bagehot, "And in so far as the apparent prosperity is caused by an unusual plentifulness of loanable capital and a consequent rise in prices, that prosperity is not only liable to reaction, but *certain* to be exposed to reaction. The same causes which generate this prosperity will, after they have been acting a little longer, generate an equivalent reaction."⁷ That is, over the course of an economic expansion, financial markets become increasingly susceptible to instability in response to any random shock. Thus, fragility is an endogenous feature of modern market economies. The risk levels of all financial contracts are interdependent in that they jointly depend on the state of the aggregate economy.

Systemic risk, as that term has come to be used, is like the mania and fragility models in that interdependence creates the possibility of falling dominoes; all three models exhibit that common systemic characteristic. However, modern discussions of systemic risk do not emphasize the mass delusion of a mania, or the endogenous common association with the aggregate economy found in fragility. The systemic risk model seems to postulate the existence of some new, third externality that makes private calculations of

⁷ Bagehot (1921), p. 146.

risk understate the true susceptibility of financial contracts to loss. In other words, absence of incentives for participants to internalize all costs associated with certain instruments creates a problem at the aggregate level that is not apparent at the micro level. The presence of the externality invites government intervention to restore the equality of private and social marginal cost.

A major difficulty with the systemic risk concept comes in trying to identify the nature of this new form of externality that pushes private cost below social cost. Some have argued that borrowing is like an internal combustion engine, polluting the financial market atmosphere. When I lend to you by reducing my liquidity or otherwise accept greater risk, I increase the probability that I will be unable to meet my obligations to others. This would represent a negative externality from the point of view of my creditors, if they were unaware of my lending to you. The argument breaks down, however, to the extent that, acting out of self interest, my creditors are able to internalize the supposed externality. Loan covenants, for example, protect a creditor from a debtor entering into unforeseen debt or credit relationships. More generally, the expectation of internalizing this potential externality is recognized in the eternal watchphrase, "Know thy counterparty!"

In the case of derivatives, a variant of the pollution argument has emphasized the concentrated dealer market. Each major dealer is the source of an interdependence among the exposures of its worldwide circle of end users. Evaluations of counterparty risk exposures to these end users should include a dealer risk, analogous to country risk, that would be too trivial to notice in a less concentrated market. Similar allowances might be made for interdependence arising from the use of common operations centers, payment networks, legal advisors, or credit rating services. Evaluating risk is not a simple matter; it involves compound probabilities and cross correlations.

In general, the interdependence envisioned in the systemic risk model seems to involve the sensitivities of many large counterparties to one another. Derivatives and globalization of markets may indeed be producing more complex compound probabilities of trouble. However, so too is the information age vastly expanding the ability to monitor counterparties and markets. If sophisticated financial engineering can produce complex

derivative products, cannot that same sophistication estimate the resulting increasingly complex compound probabilities of trouble?

The point is that there seems to be no reason to believe that the potential externality of increasingly complex financial relationships has outdistanced an increasingly powerful ability to internalize that potential externality. The commercial overhead of modern financial centers -- including satellite-fed, on-line, worldwide information and monitoring systems, armies of legal talent, and even on-site monitors from the rating agencies -- all reflect the substantial expenditures of firms trying to internalize their risk exposures.

As long as economic agents are able to estimate compound probabilities of failures, systemic risk is indistinguishable from normal credit risk. Knowing your counterparty and your counterparty's counterparties, and even your counterparty's counterparties' counterparties, should lead to quality spreads in market prices, to prudent loan loss reserves and capital from which to absorb losses, and to equality of the private and social cost of risk.

Suppose that no wedge between private and social cost is inserted by the inability to evaluate and control interdependency. Then, either there is no wedge -- in which case there is no policy basis for concern about systemic risk -- or the wedge originates from some other source.

Suppose that markets are perfectly able to, and do, price the risk of financial dominoes falling in a systemic collapse, but that politicians, acting for society, are unwilling to tolerate the consequent losses to individual constituents. Politicians therefore imagine a wedge between private and social cost, believing the latter to be above its "true" level. The failure of markets to internalize this imagined extra social cost would lead to a political perception that specialized risk-management products were being overproduced. The problem would not be derivatives; the problem would be that politicians have a lower tolerance for risk than do market participants. The legislative and regulatory corollary would be a challenge to reduce losses without creating a moral hazard by subsidizing risk-taking.

Moral Hazard

Perhaps the most troubling aspect of the widespread apprehension about systemic risk consequences of derivatives is the seemingly equally widespread conviction that government -- meaning central banks and deposit insurance providers -- can be counted on to prevent a systemic collapse. Even if government had no such intention, the conviction that it would come to the rescue produces a growing externality in the form of unmonitored, compound probabilities of trouble. Systemic risk becomes real, though it need not be, but who bears the risk? Likely, it is taxpayers, through the central bank and deposit insurance system, whose exposures would grow while private exposures would decline. More important, what is the direction of causation? Does growing systemic risk invoke central bank risk-bearing because it is socially more efficient, or does the apparent willingness of central banks to bear risk allow markets to adopt financial specializations whose systemic risk externalities are downloaded onto central banks?

Here is where central banks must tread very carefully. There is a moral hazard in reassuring markets, or in allowing markets to believe incorrectly, that a lender of last resort will act, and at low cost, to prevent a contagious spread of broken promises. If systemic risk is becoming as worrisome as we are led to believe by some commentators, it seems likely that the reason is not innovations in financial technology, but the moral hazard of central banks' implicit willingness to underwrite that risk.

Moral hazard can be a real danger in central banking, as was demonstrated during the last great spurt of financial innovation during the cash management revolution of the 1970s. Prophets had foretold the coming of cashless transactions. What happened in the United States, however, was that both cash transactions and cash *balances* were eliminated. Increasingly over the 1970s, reserve balances were created by central bank daylight credit, on demand, to accommodate transactions. Not until the early 1980s did the Federal Reserve discover the extent to which its free daylight credit, rather than someone's pre-existing, positive reserve balance, was the medium of wire payment; that a large chunk of private payment system risk had been transformed into Federal Reserve credit risk.

Efforts to reduce and manage Federal Reserve payment system risk in the past decade largely have involved digging out from under a mountain of daylight credit initiated during the cash management revolution. That story began with the central bank inadvertently absorbing the externality of payments system risk, rather than creating institutional mechanisms by which private parties would be led to internalize that risk.

Now a risk management revolution is in full swing. The specter of growing systemic risk is used to rationalize nonbank access to the discount window, to seek direct nonbank access to Fedwire payment finality, and to call for regulatory guidelines for derivatives contracts that could become the leverage for obtaining central bank assistance when they prove to be flawed. The regulatory challenge is to avoid these snares. Incentives must be created for participants to internalize risk. This is essential if we are to avoid socializing losses. As central bankers, our role is to supervise markets by spreading information that promotes knowledgeable risk-management structures, while avoiding wholesale reassurances that timely central bank money creation will ameliorate trouble.

Concluding Remarks

Rapidly spreading use of derivatives suggests that they are expected to add value to those on both sides of contracts. Derivatives do not add to or subtract from the risks that are inherent in a modern financial system. They do, however, allow existing uncertainty to be borne more efficiently. Financial innovations are to be welcomed as basically wealth enhancing. As my colleague at the Federal Reserve, John LaWare, has said, "Derivatives ... have been used primarily to contain risk....A ... useful definition of banking is that the banker essentially manages financial risks for his depositors. His job is to manage risk, not avoid it".⁸

The information age is changing the way risk is managed. "This is a scientific revolution," said former U.S. Secretary of State George Schultz in explaining the implications of the information age to Mikhail Gorbachev (too late, as it turned out). He went on, "There was a time when a government could control its scientific establishment

⁸ LaWare (1994), pp. 5-6.

and be basically successful. No longer. To keep up today and in the future means that scientists will have to be in constant touch with the 'thinking community' around the world. And this is an information revolution. The inability of one nation to be predominant in the international financial world is going to be repeated in field after field. The key is going to be knowledge-based productivity... ."⁹

To the extent that derivatives are not well understood, surprises should be expected and should be no cause for concern as long as information about derivatives use is not hidden, and is matched by attention to the adequacy of liquidity and capital. A more significant danger is that we smother market incentives for counterparty scrutiny with overly-generous central bank assistance.

Some of the advocacy of new legislation or regulation has been based on the view that the entire financial system could be jeopardized by the losses sustained by a single large participant in derivatives markets. My view is that such vulnerability has not been established. In fact, I believe that certain proposals might actually increase systemic risk because they would penalize standard risk-hedging methods and change behavior to get around the regulations. Those who argue that financial innovation calls for new regulations should remember that new regulations are very often the stimulus for new innovation.

The ultimate regulator of any economic activity is the market. In the case of finance, the global marketplace is a powerful source of discipline. As we consider proposals for action by governmental authorities, I suggest that we establish a litmus test. Namely, in the words of Federal Reserve Chairman Greenspan, "The relevant question ... is whether private market regulation is enhanced or weakened by the addition of government regulation."¹⁰

⁹ Shultz (1993), p. 893.

¹⁰ Greenspan (1994), p. 26.

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