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Derivatives: The Ultimate Freudian Slip-Up
by Eugene H. Rotberg

My comments today are divided into two parts -- first, a reminiscence of the financial developments in industrialized countries over the last several decades -- how we got where we are; second, the cumulative effect of these events on financial institutions, on regulators, risk takers and risk managers, and what they did or didn't do, and why. My remarks are quite informal. I ask you to bear with me if my comments are overstated, repetitious, or elliptical. That's what comes from the absence of a carefully worded and polished text. Let me start with a review first of some of the significant developments over the last 20 years before I get to a Freudian interpretation of derivatives.

The Environment

- Floating exchange rates. At first the world was fixed. Then the Yen rose from 360 to the dollar to 300 to 240 to 200, deteriorated to 300, revalued to 120 to below 100 -- with many changes of direction in between. That volatility, which occurred in many currencies, created the incentive to speculate or hedge on potential exchange rate movements -- or if possible, to cause them. That, in turn, simply meant increased market risk and a proliferation of products for protection or speculation.

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- **Volatile interest rates.** In the U.S., long-term interests moved one percent in the period 1955-1965. Since then, long-term rates have moved from 7% to 15%, down to 8%, rose to 12%, down to below 7%, and recently up again. Short-term dollar rates have fluctuated between 3% and 20% and everywhere in between. That volatility also created a potential for profit by speculating on interest rate movements. That, too, put certain financial intermediaries -- banks, in particular -- at risk -- particularly if they were mismatched, as many were, between the asset and liability sides of their balance sheets. The asset side was fixed and often leveraged; the liability side, interest-rate sensitive. Not smart.
- **There were huge shifts in savings:** build-ups in Japan, Germany, elsewhere in Europe and Asia, OPEC. Governments in the last 20 years, without precedent, permitted the tapping of those domestic savings by non-resident borrowers and investors by permitting their savers to invest outside their own country and even to sell their own currency to do so. Similarly, those seeking capital had the freedom and risk to go outside their borders -- outside their currency -- for capital.
- **Deregulation of financial intermediaries** let everyone in everyone else's traditional line of business. In industrialized countries, insurance companies, banks, pension funds, securities firms were permitted to compete for savings between end buyers and sellers, both domestically and worldwide. They offered remarkably similar

products. Financial monopolies within a country in particular sectors were virtually dismantled -- except in Japan.

- **Lowest common denominator regulatory and supervisory controls.** If a financial intermediary could not offer particular services because of national controls, it moved its operation to a more accommodating environment. Or, if the site became too intrusive, financial institutions shifted to a different product, say, foreign exchange trading, where leveraging was the rule and quite difficult to understand or regulate.
- **Communications.** That let everyone know what all markets and participants were doing and seeing at the same time. That, in turn, narrowed spreads between end buyers and sellers. However, the high volumes became destabilizing when markets responded to the same information. The narrowing of spreads between buyers and sellers, a natural consequence of the number and invasiveness of players, inexorably damaged middle man profitability. The increased volumes -- liquidity, however, did not reduce price volatility given the immediacy of the information flow. It increased it. It is a myth that increased liquidity and volume reduces volatility. It increases it. Increased liquidity merely narrowed the financial difference between buyers and sellers -- a rather unimportant economic event, except for the profit pressures on the intermediaries -- who inexorably were pushed into other alternative ways of achieving a decent return on capital in an increasingly volatile environment.

- **Disintermediation: money market funds vs. bank deposits; commercial paper vs. loans; short-dated governments vs. C.D.'s; securitized mortgages vs. bonds. That meant that each product and financial intermediary "cannibalized" the savings base.**
- **Clients developed market expertise and capacity to deal with each other. That removed the necessity for the use of any financial intermediary between the ultimate buyer and seller. That also created profit pressures on intermediaries.**
- **An accommodating accounting system. That permitted failure and risk to stay undisclosed because of the practice throughout the world of not marking assets to market -- despite their depreciating value.**
- **An asymmetrical compensation system. That permitted risks to be taken by managers and traders with potential asymmetrical rewards for getting it right with minimal downside penalty for loss.**
- **Government insurance of the funding source for banking institutions. In the U.S., FDIC and FSLIC insured the banks and S&L's, while at the same time deregulating how the deposits could be used. That removed the creditor as a constraining influence over the deployment of assets as governments permitted an ever wider range of investments for banks and thrift institutions. In short, the liability side of the balance sheet was**

nationalized; the asset side alone was privatized. Bad news.

- **Direct and substantial government intervention into foreign exchange and credit markets.**
That meant a force would directly intervene in the market, but instead of as a profit-driven player, it was a politically-driven player – therefore a potential patsy for the private sector. Moreover, combined with depositary insurance, it meant that banks, for example, could now speculate on the value of a currency – in an adversarial position against their own government or Central Bank with the government locked into making political, not financial, decisions. Yet the banks' funding for such activity was not only financed, but guaranteed by those same governments. Governments, therefore, found that (a) they were in an adversary position to their banks; (b) they didn't have the resources of the private sector in conducting FX activity; (c) they were making political, not market-based decisions; (d) they fund and guarantee their market adversaries; and (e) they, indeed, did not even use the same kind of leveraged products in conducting their rate stabilizing activity. Not a happy situation for Central Banks or governments.
- **Securitization.** That meant if you could sell an asset after putting it on your books, as a practical matter, you need not worry about credit quality. Someone else would pick up the pieces. Securitization and the prospects for quick liquidity, I believe, over time, have damaged the normal attention to prudential credit assessment.
- **Finally, financial engineering.** It gave great advantage to first users. But it was easily

imitated – replicated – by others. Arbitrage opportunities were quickly identified and disappeared. More important, the products were complex, leveraged, not readily understood by senior managers or regulators, and off balance sheet, which meant that they were and are "unrecorded" with unknown or uncertain risk and not readily subject to traditional accounting or risk management systems. And very little was on line.

Such was the environment. Such is the environment.

That brings me to my second point – the result: substantial competition and pressures on profitability in a volatile environment – all in the context of rather uncertain managerial and government expertise. But, I am getting ahead of myself. Let me comment on the competitive pressures.

There developed tremendous worldwide competition, given the foregoing, amongst financial intermediaries for six things: (1) for client savings; (2) for new, and hopefully not easily replicable, products, particularly if off-balance sheet, for both proprietary trading or for clients; (3) for a protected or monopolistic position, or, if that were not available, the first contact point between buyer and seller or between borrower and investor; (4) for methods to create liquidity for the sale of assets once not marketable; (5) for a non-regulated environment; and (6) for products which at the margin could distinguish a manager of money from competitors, in a substantial way. Leverage. And with virtually no risk management system in place.

In the early '70s, financial intermediaries, particularly securities firms, sought to simply repeat each other's "historic" profit center, as if these profit centers were infinitely expanding ones. It was as if profitability available for a few firms from a particular line of business could be replicated by 50 firms, consistently. That was not the case. For example, securities firms sought to establish retail operations, but there were too many players, too much information, too many pressures on commissions to assure decent returns on equity. Some firms shifted to financial engineering, but that, too, was replicable as arbitrages quickly disappeared for the sophisticated players. Positioning – trading – was and is dangerous given the volatility, and shifts in the slope of the yield curve made the cost of carry uncertain. Niche operations were profitable for awhile, but we became overbanked, over-securitized, with some players protected, others not, because of diverse regulatory requirements in a given country and across countries. There were, and are, simply too many intermediaries offering similar products seeking the same investors or borrowers or clients with shrinking savings as access has opened up worldwide. At the same time, the preoccupation with liquidity almost by definition contributed to an underestimation of market risk and a disdain for attention to creditworthiness – and all of this furthered by unrealistic accounting conventions.

The effect of the pressures on profitability and of disintermediation should not be underestimated. It resulted in high risk assets to be taken on the books of S&L's and insurance companies – permitted because traditional profitability had been eroded by disintermediation and narrow spreads on traditional business. The shift to leveraged and illiquid instruments by money managers was in response to competitive pressures, as was the development of the massive and

leveraged speculation on foreign exchange markets and the use of equity OTC derivatives. Essentially, the market players sought instruments which were not transparent and not replicable, and from an end user's point of view, leveraged, hopefully, with minimal mandatory disclosure, and requiring great sophistication. The same kind of pressures were felt by managers of other people's money.

Let me talk, specifically, about derivatives.

Derivative products put considerable strain on senior management and on customers and regulators to evaluate risk and profitability. This, in large part, was due to the fact that there were, and are, literally, scores of complex, highly-leveraged products, painstakingly constructed, for which there was little empirical experience to define and circumscribe the underlying risk. It had to be that way in order to develop and maintain a profit center. If uniform, no profit.

Virtually all financial intermediaries, inevitably, sought a product which permitted leverage, minimal capital, few regulatory controls, low expense to operate, proprietary risk taking where the other side was not a client – preferably a non-market player – a government – who could not act rationally for political reasons. Or, find an end user client under pressure to produce profit. Derivatives – in all of their arcane forms – were the answer. I think, for example, when the other avenues of profit shut down, foreign exchange trading became the new game – an unregulated and one-sided game where the Central Bank could not act as a rational market player, did not have the staying power – the money – and, in any event, was and is ambivalent

about damaging institutions whose deposits it guarantees and whose viability it needs to finance domestic deficits.

I do not think it useful to define derivatives. I find it more helpful to describe why they are different, and potentially dangerous. First, derivatives can be used to leverage risk – interest rate, currency rate, share prices – without putting up a lot of money. That simply means that during a period of volatility, losses or gains are magnified manyfold. And often the leverage is asymmetrical; that is, the potential gains are limited, while the potential losses may be multiples of the maximum gain.

Second, current accounting conventions mask error, risk and mistake. They were never designed as risk management tools. Accounting conventions have developed mainly around their tax consequences, which may be one of the reasons why it has been so difficult to develop a comprehensive set of conventions which also can be used for risk management purposes. The truth is we do not, generally, mark derivatives to market. Many derivatives are unmarkable. Yet they must be marked in a risk management system. In certain transactions, mistakes can be hidden because accounting conventions do not record them, either because they are ad hoc or there is no market, or they are off balance sheet, or they are embedded in another piece of paper. There is, therefore, little reality testing. Just as we continue to pretend that a rolling loan gathers no loss, we pretend that if a triggering event occurs in a different time period, the loss can be delayed. And when losses can be ignored, greater risks are taken. The latest FASB rules on derivative accounting are a beginning, but are deficient because they will not, yet, put the

users under the pressure involuntarily of admitting to failure, risk and error – even to internal management. A risk management system must ask "what if."

Third, senior managers are rarely as informed as traders, and legislation will not make them so. Lawsuits will. Typically, senior management is usually unaware of the technical operations of financial engineering. Worse, they are often afraid to ask, out of concern of admitting to their lack of mastery over the subject matters. I think we also must admit to the fact that there is a good deal of underlying hostility to financial superstars, mathematicians, physicists. Senior management often believes the financial engineers are too young; too overpaid; they have too much control; they are too smart; they know what to hide and, too often, how to hide what they are doing and why they are doing it. Management is not trained, moreover, in the intricacies of convexity or volatility. As a result, reports are inadequate, supervision thin. Risk management leaves a lot to be desired. Worse, most of us have great difficulty in admitting to those who report to us that we do not know nearly as much as they. That is a recipe for potential disaster and it is exacerbated by the fact that as one goes up the managerial chain, the technical capacity to exercise risk management diminishes exponentially. On the other hand, for multinational corporations, the correct timing of a move in the foreign exchange markets can do wonders for a fall-off in sales.

Fourth, many products, particularly over-the-counter derivatives and aspects of the mortgaged-backed market are idiosyncratic, ad hoc, unpublicized, illiquid. That means they are difficult, if not impossible, to price or value. It means that if held as collateral, there may be no buyers in

the event of a forced sale, or the spreads between buyers and sellers may be so wide that even hedges are ineffective. That means that a dealer which holds such instruments may have to sell short instead, say, plain vanilla U.S. Government bonds in very large amounts to protect itself.

Fifth, the relationship between the banker and the other side is typically unclear, at best, and possibly adversarial. Is the other side of the dealer a client, or a customer, or a beneficiary, or an adversary. What is the responsibility and practice to provide stress modelling scenarios to the "other side." Is the dealer hedged or is it betting the opposite way from the end user. Whatever the obligation of disclosure, it is clear the end user rarely asks.

I cannot resist making reference to the environment in which the operators work. We are always shadowed by how we cope and how we make decisions in a competitive world – which may be as important as anything else in explaining some of the traumas recently observed in the financial world:

1. We respond to peer pressure. Develop and then sell that magic zero coupon bond with a perpetual maturity so a borrower needs pay neither interest nor principal.
2. We want to capture rewards quickly and visibly so we can look good if we can't be good.
3. We deny blame or responsibility. We seek not to be identified as the provider of unwisdom.
4. We do not measure opportunities lost.
5. We rely on sympathetic accounting conventions. We need not show losses until we sell.
6. We design performance measures to cover-up error. They are called benchmarks.

7. Senior management is rarely as informed as operational managers.
8. We make decisions based on: Will we be found out? Discovered? Identified as the wrongdoer? The recommender of unwisdom? Will we be hassled – by peers, superiors, the bureaucracy? Do we really want to have to explain this stuff to someone who spent his or her life in sales or marketing?
9. We are subject to the herd instinct. If we get really good at it, maybe we can become investment bankers.
10. Leverage is fun.

A risk management system must address each of these environmental factors.

Sigmund Freud – or perhaps, one of his followers – would have been a wonderful speaker here. He would have explained the use of derivatives and financial engineering as denial -- the pretense that we are doing one thing when we really mean to do something else (we are not speculating, only hedging); the strange relationship between the banker and its client as one of ambivalence and reliance on the father figure; the use of accounting conventions as an example of repression and the absence of reality testing; the work environment as the pleasure/pain principle – current pleasure for future damage, let someone else pick up the pieces; doubling our bets in response to loss as counterphobic behavior; termination therapy as what happens when the CFO and Treasurer get caught; transference – how the trader seeks to shift responsibility to his or her superior when the string runs out; leveraging is bulimia; dynamic hedging is desensitizing; "I really prefer clearance and back-office work," repression; "I relied on the risk manager" is but an interpretation of dreams, and the ultimate in narcissism, "I am the market."

Let me return to management responsibility. In some places, if truth be known, some managers are still somewhat titillated by the fun or the competitive pressure to execute the latest exotic instrument simply because it is market clearing at a cost which appears low compared to some benchmark. Sometimes, too, there are pressures for the financial operations to make up for, as a profit center, the shortfalls in the main line business. That responsibility is sometimes initiated voluntarily in an effort to show that the corporate treasurer/CFO does not merely publish accounting statements and issue commercial paper, but is intimately involved in determining whether or not the company makes a profit and a yet higher return on its equity. I mention these points simply because directors and shareholders are increasingly becoming aware of the risks of such activity. They are beginning to ask about the risks in the new world of financial engineering. Specifically, an on-line risk management system must, at the least, evaluate the following:

1. **Liquidity Risk.** You think you are precisely hedged, but the product is so esoteric and idiosyncratic that you cannot sell it because there is simply no market for the product. You may want to either capture a profit or minimize a loss, and you can find no buyers. This is typical in the OTC derivative market or parts of the mortgage-backed securities market.
2. **Credit Risk.** Your counterparty has lost money and fails. You were on the right side of the market, unfortunately, your counterparty was on the wrong side. Or, your counterparty would ordinarily be just fine, but its counterparties, strangers to you,

default.

3. **Legal Risk.** The laws in Asia and Western Europe are not nearly as clear as those in the United States. You believe that you are totally netted with a particular counterparty; that you had a net zero position and, in the event of default and bankruptcy, you would be protected. It turns out that the netting rules outside the United States are not so clear, and you may have to get in line with other creditors or depositors.
4. **Event Risk.** A war takes place; an earthquake occurs; a flood of a magnitude not seen in a hundred years washes over the land; a cartel falls apart; oil prices quadruple; tax laws change, and the market in which you had an open position, or even hedged, moves in a magnitude not only unforeseen, but totally outside past models. They always do. We are in trouble.
5. **Basis Risk.** You thought you were hedged. You believed that investment A hedged instrument B. You were long in one, short in the other. They, in fact, moved in the same direction. The three-year Treasury note in which you were long deteriorated in price, but unhappily, the five-year note, in which you had a short position, increased in price. You lost both ways. Again, the only perfect hedge is in a Japanese garden.
6. **Leverage Risk.** You are so leveraged that even a small market movement will prompt a margin call. The security which is out of line will move back to its normal position on

the yield curve, but someone out there, for one reason or another, has chosen to put pressure on a particular coupon, a particular security, at a particular point on the yield curve, and while over the next week or two it will surely come back into line, in the meantime, you must liquidate. Worse, liquidation is difficult because the product is idiosyncratic. Your loss becomes very visible.

7. **Operational Risk.** Back-office systems, yours or someone else's, fall apart; credit monitoring systems break down; documentation is flawed; transcription and recording mistakes are made; settlements are delayed; systems do not capture fully the nature of the transaction – the computer program doesn't yet cover that kind of transaction (they are working on it). And, it is all quite expensive to put in place and keep it up to date. And, most important, there is no natural constituency to support the financial and resource expenditures that are needed, particularly if you are not supposed to be a profit center and are trying to keep quiet the risks you are taking.

That now brings me to some final points which, because of time constraints, I can only briefly note here – what do governments, worldwide, worry about. What are the choices and dilemmas they face?

- How to encourage banks to be prudent about lending without constraining their lending. The U.S. is a good example. The banking excesses and the warnings from the authorities have "cooled" bank lending – perhaps too much given the state of the economy.

Increased capital requirements designed to protect the taxpayer inexorably have reduced credit extension. Once burned, twice shy.

- How to maintain an adversarial and supportive relationship with financial institutions, particularly in the context of institutions who may be acting in ways inconsistent with national policy in, say, FX trading, given the unique relationships between banks and government.
- How to control banks who set up subsidiary activities offshore where there are few supervisory or regulatory controls and where, as a practical matter, any losses will be borne by the parent and its insured depositors.
- How to become informed, and set what kind of requirements for derivative products -- across countries and different kinds of financial institutions. What precisely do we intend to do to regulate, and how, once the label is attached.
- How to mark assets to market without destroying confidence in the banking or insurance industries.
- How to control, or whether to control, the credit-extending activities of securities firms -- particularly in areas which directly affect national monetary policy.

- How to create an environment for banking institutions and securities firms which is conducive to profitability when there are so many financial intermediaries and products worldwide competing for the same customer base. Sooner, not later, they will get in trouble as the need for risk taking increases an attempt to derive profit in a competitive environment.
- Governments are fundamentally concerned about the domino syndrome. Too many intermediaries, too many non-creditworthy borrowers, too much expertise outside of government, too many loopholes, too much leverage. Too much off-balance sheet.
- How to adjust interest rates to be sector-specific; say, to apply only to FX speculation. The freedom to move currencies across countries means exchange rate stability will be difficult to establish. Moreover, transactions are done routinely outside the U.S. which, in the U.S., would result in severe criminal penalties. It is not a market which would survive careful scrutiny, say, by the SEC, without resulting in criminal indictments.

These are not easy problems to handle. Their "resolution" would require an international consensus which does not now exist. It also would involve a resolution of competing and divergent principles of regulation and control both within and across countries. Private sector management clearly needs to be better informed, as do governments and Central Banks, about the intricacies of market products. But, fundamentally, that intricate knowledge is not now in the hands of policy makers. It should be.

P.S. The Final Therapy - Beyond the risk management system

- **Know what the risks are.**
- **Know the costs, the premium, the present value outlay for protection.**
- **Admit what you don't know.**
- **Ask "what if." Quantify "what if."**
- **Clarify precisely what you are trying to do.**
- **Ignore accounting conventions. They are not useful risk management tools; they are designed to make our lives easier and comfortable.**
- **Always measure opportunities lost.**
- **Never penalize those who work for us for mistakes, or reward them for being right about markets. It will go to their heads and is counterproductive, and in any event, material compensation will not correlate with their ability to predict the future next time.**
- **Ask for alternative approaches and costs to meet objectives.**

- **Spend resources on systems and people smarter than we are.**
- **Talk to them.**
- **Do not hire or maintain staff whose ethics are such that you would not want them to marry your son or daughter, or your mother or father.**
- **Try and figure out why the transaction makes sense to the counterparty end user. Understand both sides of the transaction.**
- **Fully understand the role, risk, and profit of our financial adviser/banker. Be modest, admit to unsuredness and uncertainty.**

Thank you.