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# **Consequences of Liberalizing Derivatives Markets**

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# I. Introduction

Derivatives are financial contracts whose price is *derived* from that of an underlying item such as a commodity, security, rate, index or event.<sup>1</sup> While derivatives markets have been in existence for as long, and by many accounts even longer than that for securities, it has been their growth in the past 25 years that has made them one of the pillars of financial systems.<sup>2</sup> This is true not only of developed, but also developing economies. Section II below will provide some indicators of the size and growth of derivatives markets in developing economies. Despite the tremendous growth in the size and use of derivatives markets, their role in economic development and their regulatory treatment have received far less attention than banking and securities markets from both the public and policy makers.

In a manner consistent with this neglect, the push to liberalize capital market in developing countries in the 1990s showed no apparent concern for the potential dangers of unregulated derivatives markets. The need to address these dangers was most likely neglected for the following two reasons. One reason is that the push to liberalize financial markets focused largely on the elimination of controls, restrictions or taxes on capital flows, and this focuses on bank lending, securities issuances and trading, and foreign direct investment. This ignored the fact the trading in derivative instruments is often closely related to transactions involving these capital flows.<sup>3</sup> The second reason stems from the theoretical economic framework that served as the foundation for capital market liberalization. This economic theory held that financial markets sufficiently disciplined themselves, and that they were more efficient than those distorted by government regulation. The theory concluded that the fewer, or the lower the degree, of regulation the higher the degree of efficiency.

In hindsight, this proved to be a costly error irrespective of whether it was due to an oversight or ideological over-confidence. If developing countries were imprudent to remove all capital controls and deregulate their banking sectors, then they were even more reckless in their treatment of derivatives.

In order to help rectify this omission in the future, this policy analysis will layout an analysis of the public interest concerns with derivatives trading and markets in developing countries and suggest a set of regulatory measure to reduce derivatives related financial sector vulnerability and to increase market efficiency.

While derivatives performed the economically useful purpose of risk shifting (hedging) and price discovery,<sup>4</sup> they also created new risks that were potentially destabilizing for developing economies. The following is an analysis of how derivatives played a constructive role in channeling capital from advanced capital markets to developing economies, and how at

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<sup>1</sup>) The term derivatives is used to mean financial instruments such as futures, forwards, swaps, options and structured securities. For a more complete definition and description, see Dodd (2000a, 2000b).

<sup>2</sup>) For an excellent history of derivatives see Swain (2000).

<sup>3</sup>) See Dodd (2002b) for a discussion of how the use of derivatives can shape capital flows to developing countries.

<sup>4</sup>) Price discovery, which will be treated below, refers to establishment of benchmark market prices that are used more broadly in the economy.

the same time they pose a danger to the stability of the financial system and the overall economies of developing countries.

While derivatives play a positive role in the economy by providing enhanced price discovery and greater efficiency in risk shifting (e.g. hedging), they also pose potentially negative consequences. The potential problems with derivatives can be broken down into two categories.

The first category concerns issues that arise from the "abuse or misuse" of derivatives. This includes fraud, manipulation, tax evasion or avoidance and the distortion of information that is vital for the efficiency of the market. The second category in pertains to the negative consequences from derivatives trading and derivatives markets. Whether or not derivatives are used or misused, improperly regulated derivatives markets can result in the creation of new risks, greater levels of market risk for a given amount of capital in the financial system, and in higher degrees of financial sector vulnerability. Section III below will address the many components of both categories of problems related to derivatives markets.

Taken together, these potential problems pose a substantial safety and soundness challenge to developing economies, and they therefore warrant immediate regulatory remedy. Towards this end, Section IV of this chapter concludes with a policy proposal that is designed to curtail if not eliminate these problems while encouraging the use of derivatives for productive purposes.

## II. Expanding the definition of "capital markets"

The usual definition of capital market liberalization, including both the policy principles and their implementation, needs to be broadened so as to encompass derivatives markets and their impact on economic stability. Establishing the notion of derivatives markets as an integral part of financial markets will help address the concerns that the inadequate regulatory treatment was due to their being overlooked.

A more complete view of capital markets is, by analogy, a four legged table made up of securities markets (issuing and trading bonds and equity shares), banking industry (issuing loans and providing payment and settlement services), insurance and pension funds (providing future income and collateral for lending) and derivatives markets (risk management and price discovery). All four legs serve to support the table, and it is no more stable than its weakest leg.

It is perilous to focus exclusively on securities and banking even though that does describe the largest share of developing country financial market activities in the past. Derivatives have been growing rapidly in scope and scale, and they have already asserted themselves in financial crises.<sup>5</sup> Their presence was an important factor in Mexico, East Asia, Russia and Turkey.

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<sup>5</sup> ) See Dodd (2002a), Garber (1998), Garber and Lal (1996) and Kregel (1998a, 1998b) for discussion of the role of derivatives in the Mexican and East Asian financial crises of the 1990s.

## **The Presence of Derivatives in Developing Countries**

Worldwide, derivatives markets are huge, growing rapidly and expanding into developing countries. By some measures, derivatives markets are larger than those for securities, banking and insurance. Although the exact size is unknown due to limited data collection efforts, the Bank for International Settlements (BIS) collects some aggregated data from the largest over-the-counter (OTC) dealers and derivatives exchanges around the world. Their 2001 triennial survey shows that trading volume in OTC foreign exchange derivatives for five Latin America countries (Brazil, Chile, Colombia Mexico, and Peru) was \$1,739 billion and for five East Asian countries (Indonesia, Korea, Malaysia, Philippines and Thailand) it was \$1,861 billion. The total figure for OTC foreign exchange derivatives trading in just these ten countries is \$3,600 billion and compares with \$2,442 billion in total foreign debt of all developing countries. The figure for Hong Kong and Singapore – developing countries with especially sophisticated international financial markets – was \$30,255 billion.

Consider the case of Brazil, the Brazilian Mercantile and Futures Exchange (BM&F) trades a wide variety of futures, forwards and options on interest rates, exchange rates, stock indexes, gold, foreign currency spreads, sovereign debt instruments, soybean, corn, sugar, coffee, live cattle, anhydrous alcohol fuel and cotton. Trading occurs through the traditional open outcry methods and electronic trading platforms that use automated order matching systems. The BM&F also facilitates OTC trades.

Through the BM&F alone, Brazil is trading over 9 million derivatives contracts a month (this includes the registration of OTC traded contracts). This is far shy of the 53 million contracts per month traded at the Chicago Mercantile Exchange in the U.S., but it nonetheless represents a large and liquid derivatives marketplace.

Another example is Korea where the Korean Futures Exchange trades futures and options in interest rates, government securities, stock indexes, commodities and foreign currency. The exchange traded 14.6 million derivatives contracts in 2002 with a notional value of 1,400 trillion KRW (or about US\$1.17 trillion).

Another part of the picture of these opaque markets concerns OTC options on emerging market debt. Gosain (1994) cites data from Paribas that trading volume in options on developing country sovereign debt rose from \$1 billion in 1989, to \$20 billion in 1991 and to \$70 billion in 1993 (measured in notional value). The most popular options were on debt from Argentina, Brazil, Mexico, Venezuela and Poland. The article contains at least one very alarming observation that because of lower costs of funding, local financial institutions in Mexico, Argentina and Brazil were "better buyers of call options" while their American and European counterparts were better sellers. The alarming feature is that developing countries, who were capital importers, were taking long derivatives positions on their own securities. That is not hedging because it does not reduce risk, rather it is taking on additional risk and that is using OTC derivatives to speculate.

## **The Growth of Derivatives in Developing Countries**

The economic functions of derivatives are close complements to international capital flows. As a result, derivatives markets emerged along with these forms of capital flows as part of an effort to better manage the risks of global investing. In doing so, derivatives facilitated the flow of capital by unbundling risk<sup>6</sup> and redistributing it away from investors who did not want it and towards those more willing and able to bear it.

A good illustration of the relationship between these financial markets is to identify the presence of derivatives features in some more conventional financial instruments. The convertible bond issued by corporations is comprised of a conventional bullet bond plus a call option on the stock price and a put option on the debt instrument. This lowers the corporation's interest cost of issuing the debt instrument, and at the same time the call option can be inexpensively covered with un-issued stock. The investor can gain if the stock price rises above the call option's exercise price at which the bond can be converted into stock, and also if the market interest rate rises so as to lower the present value of the bond's interest and principle payments.

A similar financial instrument is the convertible preferred stock that contains a call option on common stock shares (and it often contains a short call option that allows the issuer to call in the preferred stock after a certain date). Yet another illustrative example of such a structured security can be found an earlier period of development in North America. In the early 1860s, the Treasury of the Confederate States of America issued various types of bonds that were structured with a long call option position in currency and commodities. In one instance, a structured bond contained a long call option provision that granted the investor the right to be paid the principal and interest in either Confederate dollars or New Orleans Middling Grade Cotton. Another more creative Confederate issue was designed as a tri-valued call option that paid upon maturity, at the bond holder's option, the higher of 100 pounds sterling, 2500 French francs, or 4000 pounds cotton.<sup>7</sup>

Another good illustration of how derivatives can facilitate capital formation is the callable bond. This instrument is comprised of a conventional bullet bond plus a short call option (usually with an exercise price equal to par or 100% of principal). This option allows the bond issuer to gain by recalling the bond if market interest rates decline sufficiently.

Similar structures have been used to enhance capital flows to developing countries. The IMF's Global Financial Stability Report (March 2002) shows that bonds and loans issued by sovereign borrowers in developing countries used a substantial number of features described as call options, put options, structured notes, and warrants. In 1997, for example, emerging market sovereign bond and loans in the amount of \$7.6 billion were combined with calls, options or in the form of structured notes – that amounted to about 7.6% of total sovereign borrowing in that year.

In contrast, a bad example of this type of instrument is found in the puttable bonds and bank loans used in capital flows to developing countries during the 1990s. These put options

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<sup>6</sup> ) Unbundling refers to the practice of separating out the currency risk, interest rate risk, credit risk and other types of risk associated with an investment and then treating them separately.

<sup>7</sup> ) See Markham (1994) for this and other exemplary derivatives accounts.

were in the form of "hard" and "soft" puts. Hard puts, usually attached to a note or bond, gave the lender the right to demand principal repayment after a certain date, e.g. a five year note might be put-able after one year. Soft puts, usually attached to loans, gave lenders the right to reschedule the terms of their credit in the event of certain adverse "events." These attached put options facilitated lending by lowering interest costs to borrowers and by giving lenders greater assurance of recovering their principal. Putable debt is a bad example because it creates liquidity shortages in the event of a financial disruption, and it does so just at the time in which liquidity is crucial for the successful functioning of the financial sector. In sum, putable debt tends to increase indebtedness and does so in a manner that exacerbates financial disruptions.<sup>8</sup>

Most of the "hard" put options were closer to the European rather than the American style option. In these cases, which are sometimes called "Bermuda options," the lenders were granted the right to exercise the option only on specific days or perhaps semiannually; in only a very few cases were the options exercisable on a continuous basis like American options.

This putable debt instrument was used widely in the rapidly growing East Asian bond market. The IMF estimated in 1999, using available public databases, that there were \$32 billion in debts putable through the end of 2000 for all emerging countries. Of the total \$23 billion of this is from East Asian issuers, and \$8 billion was from Brazil.<sup>9</sup> Of this \$23 billion, \$10.6 billion was in the form of bonds issued from the East Asian countries listed in Table 1. Of this East Asian debt putable through 2000, \$11.5 billion are notes and bonds, and \$12 billion is in loans. An estimated 90% of the total putable debt was issued by private, as opposed to government, borrowers. Similarly, Table 2 shows the case of put options on loan contracts.

**Table 1**  
**Putable Bonds Issued from East Asia countries**

\$ million due in 1999 or 2000	
Hong Kong	\$2,642
Indonesia	963
Korea	3,986
Malaysia	1,730
Thailand	1,313
<b>Total</b>	<b>\$10,634</b>

\* IMF. 1999. *Involving the Private Sector in Forestalling*

<sup>8</sup>) There is a limited but positive case than can be made for put options on local currency sovereign debt. See Neftci, Salih and Andre O. Santos. 2003. "Putable and Extendible Bonds: Developing Interest Rate Derivatives for Emerging Markets. IMF Working Paper WP/03/201, Washington, D.C.

<sup>9</sup>) IMF. 1999. "Involving the Private Sector in Forestalling and Resolving Financial Crises. Policy Development and Review Department." Washington, D.C.: International Monetary Fund. Note that the disaggregated figures in the tables do not add to \$23 billion due to rounding and the exclusion of non-crisis countries such as Vietnam.

and Resolving Financial Crises.

According to an IMF memo written in the summer of 1997, there were instances of the use of both call and put options on bond principal and coupons in East Asia. The issuer held the call option in the event that interest rates fell, and the investor held the put option in the event of a decline in the credit rating of the issuer.<sup>10</sup> Of course it is the short put position rather than the long call option position that poses potential problems to financial market stability in emerging economies.

**Table 2**  
**Loans with Put Options Issued From East Asia**  
**\$ million due in 1999 or 2000**

Hong Kong	1,549
Indonesia	2,876
Korea	3,263
Malaysia	547
Philippines	75
Singapore	532
Thailand	1,680
<b>Total</b>	<b>10,522</b>

\* IMF. 1999. Involving the Private Sector in Forestalling and Resolving Financial Crises.

The latest data on the issuance of puttable debt comes from the IMF's Global Financial Stability Report from March 2002. This report contained a table reporting on the issuance of such debt for 1997 through 2001. This information is contained in Table 3 below.

**Table 3**  
**Emerging Market Sovereign Debt Issuance**  
*\$ million*

	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
<b>Putable Debt</b>	3,052	4,064	2,543	1,295	2,062
<b>Bonds</b>	2,497	3,706	2,449	1,030	2,062
<b>Loans</b>	555	358	94	265	0
<b>No. of issuances<sup>1</sup></b>	22	12	12	7	3
<b>Total Debt Issuance</b>	100,401	90,567	63,032	63,028	55,413
<i>Percent putable</i>	3.0%	4.5%	4.0%	2.1%	3.7%

1) Includes bonds and loans.

\* IMF. Global Financial Stability Report, March 2002

<sup>10</sup>) IMF Office Memorandum on private market financing for emerging markets: developments for the second quarter of 1997, July 17, 1997.

The above discussion of how derivatives can enhance familiar capital vehicles<sup>11</sup> is but part of the whole picture. More generally, derivatives facilitate capital flows for reason elaborated below in Section III on the "Useful Economic Functions of Derivatives."

### III. Use and Abuse of Derivatives

Derivatives markets provide at least two very important economic benefits to the economy. One is that they facilitate risk shifting which is also known as risk management or hedging. The other benefit is that they create price discovery – the process of determining the price level for a commodity, asset or other item based on supply and demand factors.

#### Useful Economic Functions of Derivatives

Risk shifting services capital flows by unbundling and then more efficiently reallocating the various sources of risk associated with traditional capital vehicles such as bank loans, equities, bonds and direct foreign investment. Foreign currency loans expose the foreign investor to credit risk and the domestic borrower to exchange rate risk; a fixed interest rate loan exposes the foreign lender to interest rate risk and a variable rate loan exposes the domestic borrower to interest rate risk; and a long-term loan exposes the foreign lender to greater credit risk and a short-term loan exposes the domestic borrower to refunding risk (sometimes called liquidity risk). Equities expose the foreign investor to credit risk along with the market risk from changes in the exchange rate, market price of the stock, and the uncertain dividend payments. Notes and bonds expose the foreign investor to credit risk and market interest rate risk, and in the case of hard currency bonds expose the domestic borrower to exchange rate risk. The financial innovation of introducing derivatives to capital markets allows these traditional arrangements of risk to be redesigned so as to better meet the desired risk profiles of the issuers and holders of these capital instruments.<sup>12</sup>

Another economic benefit is price discovery; its importance, however, is not often reflected in public policy. One key exception can be found in U.S. statutes governing derivatives regulation. In Section 3 of the Act, entitled "The Necessity of Regulation," stated – until being amended by the deregulatory Commodity Futures Modernization Act of 2002 – the following prescient economic point.

*“‘Futures’ are affected with a national public interest. Such futures transactions are carried on in large volume by the public generally and by persons engaged in the business of buying and selling commodities and the products and byproducts thereof in interstate commerce. The prices involved in such transactions are generally quoted and disseminated throughout the United States and foreign countries as a basis for determining the prices to the producer and consumer of commodities and the products and by-products thereof and to facilitate the movements thereof in interstate commerce. Such transactions are utilized by shippers, dealers, millers,*

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<sup>11</sup> ) That is, bank loans, equities, bonds and direct foreign investment.

<sup>12</sup> ) A good, short exposition of this point is made by John Chrystal (1996), and for a more complete discussion of this point see Dodd (2002b).

*and others engaged in handling commodities ... The transactions and prices of commodities on such boards of trade are susceptible to excessive speculation and can be manipulated, controlled, cornered or squeezed, to the detriment of the producer or the consumer and the persons handling commodities and products and byproducts thereof in interstate commerce, rendering regulation imperative for the protection of such commerce and the national public interest therein."*

In other words, price discovery is so important for the efficient working of the economy that it is imperative that the integrity of prices be protected. In the case of the U.S. law cited above, this includes statutory prohibitions on fraud and manipulation and regulatory oversight efforts to detect and deter manipulation before it occurs.

Derivatives can provide additional economic benefits by helping to complete otherwise imperfect commodity or securities markets, and they can help arbitrage between markets so that prices come to more efficiently reflect all the relevant information in the market.

## **Abusive and Misuse of Derivatives**

While Section II addressed the problem of derivatives markets being ignored as part of financial markets, this section addresses the problem of the lack of a theoretical economic framework to analyze the private and social costs and benefits of derivatives and thereby determine the most appropriate form of regulation for these markets.

While the risk shifting function of derivatives serves the useful role of hedging and thereby facilitating capital flows, and the price discovery process enhances the efficiency of financial as well as commodity markets, the enlarged presence of derivatives also raises concerns about the integrity, efficiency and vulnerability of the financial system and economy as a whole.

The public interest concerns with derivatives in developing countries can be broken down into two categories. The first is best described as "abuse of derivatives," and the second can be described as "negative consequences" from the misuse of derivatives. The former pose a threat to the integrity of markets and the information content of prices. In other words, they increase capital costs due to lower trust and confidence in financial and commodity markets, and they reduce market efficiency by distorting, or posing a threat to the distortion, of market prices. The category of "abuse" covers problems that arise from deliberate efforts to engage in destructive competition, such as fraud or market manipulation, deliberate efforts to engage in tax evasion or avoidance, and efforts – whether deliberate or not – that result in a distortion of information about a country's balance of payments (especially the capital account), a firm's income or balance sheet and expectations regarding the future depreciation of a developing country's currency.

The later category of "misuse" poses a threat to the stability of the financial sector and the overall economy by increasing systemic risk, risk of contagion and possibly serving as a catalyst, or an accelerator, to financial disruption or crisis. The category of "misuse" covers negative consequences that arise even if derivatives are being used primarily for hedging or risk management pursuits. The presence of poorly structured and improperly regulated derivatives markets can generate new risks, new levels of existing risk and create new economy-wide

vulnerabilities. Even though individual firms and investors successfully hedge by shifting risk from those who can least bear it and towards those who are more willing and able to do so, the entire financial sector now includes new and greater risks from the presence of this trading activity and the resulting outstanding derivatives contracts.

This last point is not to argue that the costs of these negative consequences is a sufficient case for prohibiting the use of derivatives. Nor is the point simply that these costs must be less than the benefit of hedging in order to justify the presence of derivatives markets. Rather, the primary point is to identify and analyze the origin of the costs in order to assess whether they can be adequately reduced through appropriate regulatory measures.

The remainder of this section is organized elaborates on the two basic categories of problems and breaks down each into its own relevant components.

## A. Abuse: threats to market integrity and efficiency

### FRAUD

In order to protect investors in their efforts to better manage risk through the use of derivatives, and therefore also to encourage more of this type of economic activity so as to benefit from the improvements in economic welfare that it can generate, it is imperative that derivatives markets are protected from a form of destructive competition known as fraud. It is an especially critical issue in derivatives markets, much like it is in securities market, because the contracts invariably involve commitments over time. A cash-and-carry market is by comparison much more capable of self-policing. In contrast, this time dimension often results in the fraud not being noticed for some period of time which allows the perpetrators to escape. In addition, time itself has value in financial terms and so this can further add to the magnitude of the loss.

Derivatives transaction also are susceptible to fraud because the parties – both the ultimate counterparties as well as intermediaries – are often in distant locations. Separated by space and time, derivatives transactions can be plagued by "sharp," "misleading," "false promises of returns" or other "boiler room" sales practices. Embezzlement is another type of problem arises from the differences in time and place. Additional unfair or fraudulent derivatives trading practices include "fictitious trading," "wash trades," misuse of market information and "front running" (trading ahead of customer orders). These activities can rob investors of part of all of the full value of their investment positions. Taken together, they can impose a substantial cost on risk management efforts and discourage firms and individuals from doing so.

As a matter of experience, the practice of fraud in derivatives trading is a major concern even in well established financial markets such as the U.S. There the chief derivatives regulatory agency, the Commodity Futures Trading Commission, dedicates at least 29% of its resources to enforcement.<sup>13</sup> The U.S. experience with fraudulent sales practices in derivatives, especially in the trading of options, has motivated periodic prohibitions on options trading and has resulted in

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<sup>13</sup>) CFTC budget request for fiscal year 2003 from letter of transmittal to Congressional Appropriations Committees, February 4, 2002.

a much higher supervisory and regulatory standard for options than futures or securities trading. This experience is applicable to developing countries if they adopt policy or programs such as the market based recommendations by the World Bank's International Task Force on Commodity Risk Management in Developing Countries.<sup>14</sup>

## MANIPULATION

Manipulation is not simply buying or selling for the purpose of driving prices up or down. In order to be successful the manipulator must be able to profit from doing so. The following is an overview of the basic types of manipulation and the economic consequences of this form of destructive competition.

Known as information-based manipulation, this type of manipulation involves insider trading or making false reports on the market. An example of the former is the manner in which Enron executives made early moves to cash out their employee stock options and sell their Enron security holdings. An example of the latter is illustrated by the way Wall Street firms associated with Enron made “buy” recommendations to their customers and the wider market while enhancing their firms’ profits from holding Enron securities, underwriting and other business relationships. Derivatives facilitate this type manipulation if they are excluded from regulations requiring disclosure and prohibiting false reports and from laws prohibiting insider trading.

Another type, called action-based manipulation, involves the deliberate taking of some actions that changes the actual or perceived value of a commodity or asset. For example, managers of a firm short the firm’s stock and then announce the loss of an important contract or the closing of factories. After they profitably cover their short positions by buying at lower prices, they can capture further gains by announcing the negotiation of new contracts or open new factories. Note that these two examples show that action based manipulation can be combined with insider trading. Similarly, but without insider information, investors may take a position on the stock and then pursue legislation or regulatory changes that might change the value of the assets. Derivatives facilitate this type of manipulation by helping to capture the gains from such a price change and in the case of OTC derivatives by allowing the perpetrator to build up a position without anyone detecting the entire position.

The classic case, trade-based manipulation, involves either unexpectedly amassing a large position in the market, or more likely using one market to capture the gains from creating a price distortion in another interrelated market. Derivatives are critical in this strategy. How does this work? In the latter case, a manipulator acquires a large long position in the derivatives market by entering forward or swap contracts for future delivery or future payments based on the future price. If the derivatives positions were transacted through the OTC market, then neither the government nor other market competitor would be able to observe the total position of the manipulator. Then the manipulator goes into the spot or cash market for crude oil and amasses a large enough inventory (and also contracts to sell it to buyers who will not resell it) in order to push up the present price. This raises the value of the long derivatives positions so that they can be offset or unwound profitably. Then if the manipulator can sell off the amassed inventory

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<sup>14</sup>) Summary of the Second ITF Meeting, May 3, 1999. The principal document is *Dealing with Commodity Price Volatility in Developing Countries: A Proposal for a Market Based Approach*, September 1999.

without incurring substantial losses, the manipulation will be successful. Keep in mind that the manipulator does not have to buy the entire market but merely a sufficient portion so as to move the price.

What are the public interest concerns with fraud and manipulation?

### **Protecting the integrity of market prices**

The prices established in derivatives markets are important because they are used not only by those directly involved in the market but also by producers and consumers throughout the economy. This economic meaning is expressed in the quote from the U.S. statute above, and its economic significance is immense. Manipulation is thus a matter of public interest not just because it is a problem for those who incur losses as a result of other's price manipulations, but because it threatens the integrity of the price signals and market activity.

Although not all derivatives markets result in price discovery, many of them do and many more can potentially serve this economic function. Price discovery pertains to not only the spot or cash market price of the underlying commodity or asset, but also its future prices and, in the case of options trading, the market value of the volatility of those prices. Price discovery certainly occurs in markets where derivatives are traded on exchanges. It also occurs in many OTC markets. However in these dealer-based markets the price discovery process is often not known by the entire market or the overall economy but is instead shared only amongst the major market participants. The fact that these prices are not known directly and immediately throughout the economy does not mean that price discovery does not occur; rather it poses a source of economic inefficiency due to the asymmetric distribution of this information.

### **Providing trust and confidence in market for risk management**

Derivatives markets provide economically useful tools for hedging and risk management, and the extent of their use depends on investors' trust and confidence in the integrity of trading practices and market prices. If incidents of manipulation taint the public perception of derivatives markets, then market activity will suffer from lower trading volume – thus reducing liquidity – and possibly causing a higher risk premium to be priced into the bid-ask spread. Derivatives markets need a diversity of participants with varying market views because they depend upon people taking long as well as short positions. In contrast to a marketplace tainted by scandal, one that holds the public trust will provide the basis for the creation of more liquid and efficient markets.

### **Small distortions in market prices can have a large impact on the economy**

Manipulation does not have to be grand in order to be destructive. Recent manipulation cases often involve small changes in prices that generate large gains through large derivatives positions. Similarly, small distortions in prices can have a profound impact on living standards – especially if they affect major cash crops, commodity exports or key consumer goods.

The famous copper price manipulation by Sumitomo Bank in 1995 and 1996 pushed prices above fair value for an extended period of time. While some of the benefits likely fell upon exports such as Chile and Zambia, the costs fell upon the much of the developed and developing world. Similarly, oil price manipulation in the fall of 2001 by Arcadia (a British subsidiary of a Japanese firm Mitsui) affected the import costs of many developing economies. The 1989 soybean price manipulation by the Italian commodity firm Ferruzzi pushed up the cost of food and animal feed. All three of these instances involved the use of derivatives as part of a ploy to manipulate commodity prices that were crucial to developing economies.

## UNPRODUCTIVE ACTIVITIES

Investors sometimes abuse derivatives in order to manipulate accounting rules and financial reporting requirements, to dodge prudential market regulations such as restrictions on foreign exchange exposure on financial institutions' balance sheets, or to evade or avoid taxation.

Accounting rules provide uniform standards for defining revenue, costs and income as well as identifying assets and liabilities. In the face of these rules, which include even elaborate rules such as FAS 133 in the U.S., derivative present powerful tools to transform incomes across time and national boundaries, fabricate revenue and income and hide debt and other liabilities.

Prudential regulations work by prohibiting, restricting or discouraging certain types of activities. For example, commercial banks might be prohibited from holding equity shares on their balance sheets, bank lending to any one firm might be restricted to not exceed a specified percent of their assets or capital, and some types of investments might be assessed a higher capital requirement in order to discourage excess participation by banks.

This point was stated very well by Steinherr (1998, p. 121), "But derivatives allowed Mexican banks to circumvent national regulations and to build up a foreign exchange position outside of official statistics and unknown to policy-makers and a large of part of market participants. When the crisis arrived the surprise unfolded and turned a crisis into a catastrophe." Again, he states (1998, p.278) what he describes as a fundamental proposition, "Derivatives allow financial institutions to change the shape of financial instruments in such a way as to circumvent financial regulations in a fully legal way."<sup>15</sup>

The use of derivatives to circumvent or outflank prudential regulation has been acknowledged by the IMF, World Bank and the OECD amongst others. The IMF's David Folkerts-Landau stated, "Financial restrictions on such positions [domestic equity markets] are being circumvented through derivatives transactions."<sup>16</sup> The World Bank's Global Development Finance 2000 stated it in the following way, "Brazil's complex system of prudential safeguards was easily circumvented by well-developed financial market and over-the-counter derivatives." The point was similarly stated in an OECD Economics Department Working Paper by Blondal and Christiansen (1999), "The expansion of financial derivatives, which regulators have found difficult to control, has also seriously undermined prudential controls on currency exposure."

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<sup>15</sup> Steinherr is an economics professor and former staff members of the IMF and European Commission.

<sup>16</sup> ) Quoted in David Nussbaum. "Seeing is Believing." *Institutional Investor*, September 1997.

The presence of derivatives markets pose a threat to a nation's tax system if it is not frequently updated in order to stay on top of new developments in those markets. This problem is doubly important for developing economies whose tax bases are not as well established, and where threats to their tax base can threaten critical budgetary shortfalls that can lead to excess monetary expansion or greater foreign borrowing. Derivatives transactions can be restructured so that they appear to occur as capital gains instead of interest or dividend payments (or vices versa), or as long-term capital gains instead of short-term ones. In the U.S., an employee stock option program can transform compensation from salary income to capital gains on the corporation's stock and then taxed at the lower long-term capital gains rate.

In addition to raising funds to support government activities, some tax provisions are designed also to enhance regulatory safeguards by raising the relative costs of certain undesirable financial activities. For instance, short-term capital gains may be taxed at a higher rate than long-term gains in order to discourage short-term speculation. Using derivatives, payments can be transformed from one type into another so as to evade the disincentives.

## INFORMATION DISTORTION

Although some of the issues in this subsection could also fit into some of the above categories, the importance of information in the smooth and efficient working of markets warrants derivatives related information distortions be given special attention. There are three basic types of this: firm level financial reports on income and balance sheet; balance of payments or "official statistics"; and false or misleading indicator of a currency devaluation.

Derivatives lead to transparency problems in a multitude of ways. They distort the meaning of corporate income and balance sheets as the basis for measuring the profitability and risk profile of firms. Profitability can be distorted by fabricating income or revenue, and debt can be hidden through the use of pre-paid forwards and swaps. Off-balance sheet exposure distorts the appearance of risk exposure through derivatives that reverse, exaggerate or dwarf the risk exposure indicated by balance sheets. In short, derivatives drive a wedge between total risk exposure and that reflected by a corporation's balance sheets.

For instance, a publicly traded corporation in Korea might report a balance sheet showing equal amounts of dollar assets and liabilities reflecting a neutral or balanced dollar foreign exchange position, and yet it may have off-balance sheet derivatives positions that create substantially large short dollar positions. The result is a delinking of an entity's risk exposure from that reflected in their balance sheets or public financial reports. When Hong Kong based Peregrine Securities failed in January of 1998, it drew attention to this distinction. The World Bank's Global Development Finance (1999, Ch. 2) reported that its off-balance sheet liabilities were ten-times that on balance sheet. The probable cause of this was an off-balance sheet price exposure that far exceeded the 10:1 figure. That publication also reported \$15 billion in credit losses on swaps by foreigners to Indonesian corporations – the notional value of which must have been far larger.

Accounting rules are used to calculate profits and losses, designate assets and liabilities, and determine tax liabilities and capital requirements. A recent survey of U.S. businesses reveals that 42% use derivatives primarily to "manage reported earnings" by moving income from one period to another.<sup>17</sup> Another example drawn from the U.S. experience involves two financial institutions, which are known as Fannie Mae and Freddie Mac and are arguably the world's largest hedgers, that admitting having filed financial reports which falsely understated the value of their derivatives positions by billions of dollars.<sup>18</sup> The collapse of the energy merchant corporation Enron exposed their extensive use of derivatives for the purpose of fabricating income and revenue, hiding debt as well as manipulating market prices. Although these examples are from a developed economy, it serves as a telling example that in an otherwise well regulated financial market that derivatives misuse can lead to distorted market information.

In these ways the presence of derivatives can make it difficult for firms to make an accurate assessment of their counterparties' creditworthiness. Similarly, the lack of information and data on OTC derivatives means that regulatory authorities cannot detect and deter manipulation in the immediate or related markets. In addition, the regulatory authorities cannot know outstanding positions – whether measured gross or net – of their financial sectors or major participants in the financial sector. Thus they cannot know how much risk their financial markets are exposed to in comparison to the capital on hand. As a result, it is difficult for government regulators or supervisors to track the sensitivity of the economy to changes in certain key market variables such as interest rates and exchange rates. The former chief economist of the World Bank, Joseph Stiglitz (1998), put it this way, "The increased use of derivatives [in developing economies] is increasingly making the full disclosure of relevant information, or at least the full interpretation of the disclosed information, even more difficult."

This delinking of total risk exposure from balance sheets also occurs in regards to a nation's balance sheet, whether their balance of payments accounts or fiscal accounts. A country's actual exposure to market risk was once reflected in the maturity and currency denomination of its foreign assets and liabilities as reported for its capital account in its balance of payments. Now those figures are less useful, if not misleading, because derivatives related currency exposures can add or subtract significantly from that indicated by the capital or foreign investment positions.

The currency denomination of assets and liabilities such as foreign loans can be changed with foreign exchange derivatives. Interest rate swaps can alter the interest rate exposure on assets and liabilities. Long-term loans can become short-term ones if attached "put" options are exercised. Even the form of capital or the investment vehicle can be transformed with derivatives. Total return swaps can make short-term dollar loans (liabilities) appear as portfolio investments. Also, the requirement to meet margin or collateral calls on derivatives may generate sudden, large foreign exchange flows that would not be indicated by the amount of foreign debt and securities in a nation's balance of payments accounts. As a result, the balance of payments accounts no longer serve as well to assess country risk.

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<sup>17</sup>) Woolley, Scott. "Night baseball without lights." *Forbes*, November 1, 1999.

<sup>18</sup>) Freddie Mac, as of December 2003, has yet to file new, accurate statements.

The use of derivatives by governments in the pursuit of public debt management poses similar dangers. While some governments have used derivatives successfully to reduce their borrowing costs while encouraging the utmost in market liquidity in benchmark issues, only a few – and here only Sweden has been singled out as exemplary – have done so while maintaining market transparency.<sup>19</sup> In contrast to these cost and liquidity goals, a study by Piga (2001) commissioned by the International Securities Market Association, disclosed that at least one European nation deliberately misused derivatives to manipulate reported cash flows on its debt in order to meet the Maastricht deficit target criteria in 1997.

David Nussbaum (1977) explains that one of the "main challenges facing the IMF due to the spread of derivatives is how to restructure the balance of payments accounting systems of its major member countries." He paraphrases David Folkerts-Landau as saying that "cross-country derivatives positions have played havoc with the balance of payments data" and that "one internal [IMF] estimate has off-balance positions potentially warping emerging market economic data by as much as 25%." The report by Piga (2001), mentioned above, also draws attention to the need for public entities to conduct their use of derivatives in debt management practices with a high standard of transparency. Cassard and Folkerts-Landau (1997) also recommend transparency as a high policy priority.

Furthermore, the lack of transparency caused by off-balance sheet positions is also a problem for the public in their efforts to assess a central banks' ability to intervene in the foreign exchange market. The ability to intervene is critical in the context of a fixed exchange rate regime, but it is also important in the context of a floating rate system in order to stabilize the economy following a speculative attack or other financial market disruption. The problem arises when a central bank accurately reports the value of its foreign reserves, but does not report the amount they have contracted to sell in the future through foreign exchange forward and swaps contracts.

The third type of information distortion concerns the price discovery process of derivatives markets in the context of fixed, and sometimes even floating, exchange rate regimes. Here the exchange rate or rates of primary concern are those between the local currency and the major world currencies such as the U.S. dollar. In the developing country, the forward and swap market will create a market price<sup>20</sup> that will almost certainly indicate that the future value of the currency will be below the present pegged spot rate. Relatively higher interest rates in the developing country together with interest rate parity will set a forward exchange rate that higher than the spot and thus indicating a depreciation over the near term.<sup>21</sup>

In the context of a fixed exchange rate system, the higher future exchange rate will indicate a devaluation. This will regularly send the signal that the currency is going to move off of the peg, and it will reflect the lack of confidence in the government's exchange rate policy. If in the context

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<sup>19</sup>) According to Cassard and Folkerts-Landau (1997), countries setting up debt management agencies to pursue the goal of lowering borrowing costs include Austria, Belgium, Ireland, New Zealand, Portugal and Sweden. They also mention Colombia and Hungary was pursuing similar policies.

<sup>20</sup>) The forward and swap exchange rates should be equivalent since the foreign exchange swap is just the combination of a spot and forward, or two forward, transactions.

<sup>21</sup>) The exchange rate is defined as the local currency price of a unit of foreign currency so that a higher price means that the local currency is worth less.

of a fixed exchange rate system the forward rate is not set according to interest rate parity conditions – and it makes sense that it might not because if the exchange rate peg holds then local currency sellers in the forward market continually lose as the fixed rate becomes in the future the spot rate – then the forward rate will be pricing the political viability of the exchange rate policy. In this case as well the derivatives markets is likely to pose a frustration to the government because currency appreciations are rare and so the forward rate will more likely be continually sending signals of a pending depreciation.

## B. Misuse: Vulnerability to disruption and crisis

### LEVERAGE

One of the key features to derivatives contracts is that they provide leverage to hedgers and speculators alike. Leverage in this context means the quotient of the size of the price exposure, measured in notional value or the amount of underlying assets or commodities, divided by the amount of initial outlay required to enter the contract. Take for example the leverage provided by a futures contract on the Mexican peso traded on the Chicago Mercantile Exchange.<sup>22</sup> It has a notional value of 500,000 pesos, and the amount of initial margin (alternatively called collateral) required to open the position is \$3,250 for speculator and \$2,500 for hedgers and exchange members (who might otherwise be classified as speculators). The price exposure measured in dollars is about \$45,500 (given that the peso is trading around 11 per U.S. dollar), and so the leverage for speculators is 14 times the initial investment and for the hedgers it is 18.2. Similarly for the Brazilian real, the notional value is 100,000 reals, and the initial margin is \$5,600 for speculators and \$4,000 for hedgers and members. The rate of leverage is then 6.2 for speculators and 8.6 for hedgers and members.<sup>23</sup>

This leverage for hedgers and speculators, whether using foreign exchange forwards, swaps or options, lowers the costs of capital for taking the position (i.e. assuming the risk) and therefore raises the potential gain from such an undertaking. In addition to providing leverage, derivatives sometimes further lower the cost of taking on price exposure because of lower transactions costs and higher levels of liquidity. Together, these features facilitate greater risk taking for a given amount of capital, and the extent of their use for risk taking can result in greater overall levels of exposure to price risk for a given amount of capital in the financial system. This also has the consequence of encouraging greater amounts of currency speculation and empowering those who might mount a speculative attack on a country's currency regime.

The risk-taking facilitated by derivatives can pose a problem even in the context of the Basel capital requirements. Consider an example of a developing country bank choosing between two investment strategies. One is an outright 100 million pesos of the local corporate bond (financed by borrowing abroad in U.S. dollars) or entering a 100 million peso total return swap<sup>24</sup> in which the rate of return on the bond is swapped against LIBOR (plus a spread). Under

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<sup>22</sup> ) The exchange traded derivative is used an example because its collateral or margin requirement is publicly known and almost uniform across all investors.

<sup>23</sup> ) Contract information is from the CME, and current exchange rates are from Bloomberg for December 2003.

<sup>24</sup> ) For a description of this type derivative contract see Dodd (2002a or 2000a).

Basel rules, the purchased securities would be treated as an asset on the bank's balance sheet and the bank would be required to hold capital against those assets. At a capital requirement of 8%, this would require 8 million pesos in capital. Alternatively, the total return swap, which takes the same investment position off-balance sheet, would not be treated as an asset only to the extent that it had a positive present value (sometimes called gross positive market value). Derivatives such as swaps are generally transacted "at the market" or at a par value at which their present value is zero. Only if and to the extent that the swap were to "move into the money" or acquire a positive present value would the bank be required to hold capital against the position. The present value might rise, say 10%, if local interest rates or LIBOR were to fall and the exchange rate were to remain unchanged. The bank would be assessed a capital charge of 8% on the 10 million peso present value of the swap or 0.8 million pesos on a position now worth 110 million pesos – one tenth the capital cost of purchases the securities outright with dollar denominated debt.

This concern has come to the attention of the IMF. An IMF report from 1999 stated, "Third, the growing use of OTC derivatives and structured notes is increasing the ability of institutions to leverage up capital positions. The high levels of leverage may be creating financial systems that are capable of making costlier mistakes during periods of euphoria (exacerbating the boom) and that can magnify the adverse consequences of a negative shock or a reappraisal of risk." Although alerted to this concern, it appears late for the purposes of the financial crises in Mexico, East Asia, Russia and Brazil. And although late, the IMF has never come forward with a specific policy response to this recognized problem. Although their reports often contain general statements about the need for prudential regulation, there is no support of any specific measure. To the contrary, there are as many warnings about the dangers of any new regulation.

*Whatever mix [regulation by government authority or a private self-regulatory organization] is decided upon, it is generally agreed that regulation and supervision should be designed to stifle competition. IMF Global Financial Stability Report, Chapter 4, March 2003*

*The main reasons for the underdevelopment of local derivatives markets are the underdevelopment of the underlying securities markets themselves, as well as tight regulations that restrict their use by banks and investors. IMF Global Financial Stability Report, March 2003*

## ILLIQUIDITY

The lack of liquidity, the lack of active market trading, has adverse consequences for financial markets. It means that participants cannot adjust their positions, and it also means that there are no prices to serve as benchmark or reference prices for other related financial transactions.

Liquidity is especially critical in derivatives markets. While it is troublesome in securities markets because it hampers the ability of investors to adjust their positions and to observe market prices, it is not as likely to leave investor with new levels of exposure. In

derivatives markets, trading is often a critical component of a risk management policy as hedgers and speculators regularly trade in the market in order to dynamically manage an investment strategy. If that trading were to be interrupted, then it might prevent them from rolling-over positions or offsetting other positions in securities and other asset markets. This could leave investors with market risk exposures that they did not intend.

Liquidity is also important for derivatives markets because they depend critically on there being equal number of those willing to take long and short positions. Illiquid derivatives markets can be the cause or effect one-sided markets. One possible consequence is to signal panic buying or selling or mania-based buying.

Liquidity is critical for markets in benchmark rates or prices. Like some securities markets, price discovery is of vital importance and the economic function is best provided by a liquid market.

OTC markets are much more prone to illiquidity problems. They are organized around dealers who act as multi-point market centers. However these dealers have no obligation to act as market makers – unlike their counterparts such as specialists on U.S. stock exchanges or primary dealers in U.S. OTC Treasury securities markets – and so they can and sometime do withdraw from the market at critical times.

The concluding Section IV below addresses under the heading "Orderly Market Rules" policies designed to reduce liquidity risk.

## CRISIS ACCELERATOR

In the event of a devaluation or a sharp downturn in securities prices, derivatives such as foreign exchange forwards and swaps and total return swaps functioned to quicken the pace and deepen the impact of the crisis.

Derivatives transactions with emerging market financial institutions generally involve strict collateral or margin requirements. Exchange traded derivatives require upfront, initial margin in order to enter the contract, while OTC derivatives sometimes have no initial collateral requirement (instead collateral is posted only after the position has lost money past a certain threshold).

Consider the latter case where say an East Asian firm enters a total rate of return swap on a local security against U.S. dollar LIBOR with requirements for posting collateral in the form of U.S. dollars or Treasury securities as needed to bring the value of the position up to zero or some positive level. If the market value of the swap position were to decline, such as would occur following a devaluation, then the East Asian firm would have to add collateral in order to bring it up to the required maintenance level. A devaluation or broader financial crisis would then require the East Asian firm to immediately post U.S. dollar assets to their derivatives counterparty. This would trigger an immediate outflow of the central bank's foreign currency

reserves as local currency and other assets were exchanged into dollars in order to meet collateral requirements.

As an indication of the potential magnitude of these collateral outflows, Garber and Lall (1996) cite the IMF and "industry sources" which reported that Mexican banks held \$16 billion in tesabono total return swaps at the time of the devaluation of the Mexican peso. The authors calculated that the initial peso devaluation depressed the value of tesabonos by 15%, and that this would have required the delivery of \$2.4 billion in collateral on the next day. This would explain about half of the \$5 billion dollars of foreign reserves lost by the Mexican central bank the day after devaluation. In this way, collateral or margin calls on derivatives can accelerate the pace of a financial crisis, and the greater leverage that derivatives provide can also multiply the size of the losses and thereby deepen the crisis.

This would not only quicken the pace of the crisis, but the larger positions afforded by the leverage that derivatives provide would also deepen the impact of the crisis. Some at the IMF took sanguine views derivatives activity, explaining that there was scant evidence of short positions in the local currency.<sup>25</sup> The real problem in developing countries, however, was not shorting the local currency – which would have amounted to hedging – but rather the tendency to add to exposure by accumulating large, off-balance sheet long positions such as that in total return swaps on local currency government securities.

## CONDUIT FOR CONTAGION

The Bank of International Settlement's report known as the "Lamfalussy Report" defined systemic risk as "the risk that the illiquidity or failure of one institution, and its resulting inability to meet its obligations when due, will lead to the illiquidity or failure of other institutions."<sup>26</sup> Similarly, contagion is the term established in the wake of the East Asian financial crisis of 1997 to describe the tendency of a financial crisis in one country to adversely affect the financial markets in other, and sometimes seemingly unrelated, economies. It is the notion of systemic risk taken to the level of national and international markets. The term "contagion" amounts to a more dry, clinical variation of the term "tequila effect" which was used to describe the spreading effects of the 1994 Mexican peso crisis.

The presence of a large volume of derivatives transactions in an economy creates the possibility of a rapid expansion of counterparty credit risk during periods of economic stress. These credit risks might then become actual delinquent counterparty debts and obligations during an economic crisis. World renown investor Warren Buffett referred to this as "daisy chain risk." In the same letter, he also called derivatives "financial weapons of mass destruction."<sup>27</sup>

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<sup>25</sup> ) See Morales (2001) who sites an unidentified BIS survey that short positions were only 1% to 2% notional value. This is preposterous because there are by definition equal amounts of short and long positions.

<sup>26</sup> ) Bank for International Settlements. 1990. Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries. Basle, Switzerland.

<sup>27</sup> ) Warren Buffett, letter to shareholders of Berkshire Hathaway in February, 2003.

The implication is that even if derivatives are used to reduce exposure to market risk, they might still lead to an increase in credit risk. For example, a bank lending through variable rate loans might decide to reduce its exposure to short-term interest rate variability, thus the volatility of its income, by entering into an interest rate swap as the variable rate receiver. If short-term rates were to rise, then the fair market value of the bank's swap position would rise, and thus would increase the bank's gross counterparty credit exposure above that already associated with the loans which were being hedged.

The presence of derivatives can also increase the global financial system's exposure to contagion through two channels. Regarding the first, derivatives can spread the disturbance or crisis in one country to another because many derivatives involve cross-border counterparties and thus losses of market value and credit rating in one country will affect counterparties in other countries. The second channel of contagion, identified by Neftci (1998), comes from the practice of financial institutions responding to a downturn in one market by selling in another. One reason firms sell in other markets is because they need additional funds to purchase liquid G5 currency denominated assets to meet collateral or capital requirements. In order to obtain these assets, firms will make a portfolio shift and sell securities in other markets. This demand for collateral assets can be sudden and sizable when there are large swings in financial markets.

## IV. Policy Implications and Conclusion

The following policy proposals are a set of prudential financial market regulations designed to address the problems and potential pitfalls identified above in Section III. They are intended to help make derivatives markets more transparent and efficient and less susceptible to disruptions and distortions. These policies should also encourage the use of derivatives for risk management purposes while discouraging their use in unproductive pursuits.

These prudential regulatory proposals are of three fundamental types. The first type relates to reporting and registration requirements; these requirements are designed to improve the transparency – and thus the pricing efficiency – in the markets. Reporting requirements also enable the government, and other market surveillance authorities such as exchanges, to better detect and deter fraud and manipulation. Registration requirements are especially useful in preventing fraud.

The second type of prudential regulatory measures involves capital and collateral<sup>28</sup> requirements. Capital requirements function to provide both a buffer against the vicissitudes of the market and a governor on the tendency of market competition to drive participants towards the pursuit of higher returns, and thus higher risk, investment strategies.<sup>29</sup> Collateral requirements have basically the same effect, although collateral requirements apply to transactions in particular and not institutions. Thus non-financial corporations, as well as public

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<sup>28</sup> ) Collateral, also known as margin, is an asset that is posted in order to assure performance on a derivatives contract. The higher the liquidity and the lower the price volatility, the best the asset is suited for this purpose.

<sup>29</sup> ) John Eatwell has raised some serious concerns about the ability of capital held to meet capital requirements to successfully function as a buffer against such changes. See Eatwell, John. 2001. "The Challenges Facing International Financial Regulation." presented to the Western Economic Association in July, 2001.

entities, that would not otherwise be subject to capital requirements would be subject to collateral requirements on their derivatives transactions.

This is an especially critical issue, because the current market practice for managing collateral, in so far there is one, is dangerously inadequate. Many firms trade derivatives without collateral, a practice known as trading on capital, or trade with a high threshold of exposure before collateral is required. Another dangerous practice is to use illiquid assets as collateral. Yet another problem practice is the requirement that a counterparty become "super-margined" if its credit rating drops substantially (especially if it drops below investment grade). This change requires a derivatives counterparty to post substantial amounts of additional collateral, and amounts to a large demand for fresh capital just at the time the firm is experiencing problems with inadequate capital. This market practice creates a *crisis accelerator*.

The third type of prudential regulation falls under the rubric of orderly market provisions. These are measures, which have been tested over time in derivatives and securities markets around the world, that are designed to facilitate a liquid, efficient market with a minimum of disruptions.

While the following financial policy proposals are intended to apply to developing countries, it is not intended to imply that they are especially susceptible to derivatives abuse. Instead it is to address the fact that they can ill afford it. Prudential regulations should apply to mature financial markets in developed countries as well as to developing countries. This is not to recommend a Procrustean or one-size-fits-all approach, but rather to merely recognize that derivative markets pose similar concerns to all financial systems. Also, these measures can be instituted and enforced unilaterally by any nation. While such the regulation and surveillance of transactions is better if conducted with international cooperation, it is not a necessary condition for applying prudential rules in one country. Moreover, in so far that these regulations are the same or similar as ones adopted in mature financial market economies, then there should be fewer objections by IMF, private financial firms or other laissez-faire policy advocates. Developing countries can similarly adopt these measures in order to "do as they do, not as they say."

### **Registration and Reporting Requirements**

All derivatives dealers and brokers should be registered. Like their counterparts in securities, banking and insurance, these key derivatives markets intermediaries should be registered for the following reasons. Registration requirements establish a minimum competence level for the individuals (in so far that they are required to pass exams such as the Series 7 exam in the U.S.), and they allow for background checks to detect fraud and theft convictions for salespeople and others with fiduciary responsibility. The registration of firms establishes minimum standards for capital (such as is the case with bank charters and securities brokers and dealers) and provides the basis for ongoing surveillance and reporting activities by and to the relevant public authority.

All derivatives transactions should be reported. This is not expensive, especially the age of electronic communication, and it is information that firms should be tracking carefully in any

case. When email type messages are used to confirm derivatives trades between counterparties, as is already often the case, then reporting would be not more costly or burdensome than including the regulatory authority as a CC: on the confirmation message.<sup>30</sup>

The benefits of reporting requirements is to produce a more transparent marketplace which will, in turn, help produce a more efficient market and price discover process.

Reporting requirements should include information on price, volume, open interest, put-call volume and ratios, maturity, instrument, underlying item, amounts traded between other dealers and with end-users, and collateral arrangements. Publicly traded corporations should be required to report their derivatives activities in sufficient detail so as to convey the actual, underlying economic properties and business purposes of business activities including any minority interests or special purpose entities. In order to bring off-balance sheet activities into the same light as balance sheets, derivatives would be reported by notional value (long and short), maturity, instrument and collateral arrangements. This would enable investors to better determine whether the firm was under- or over-hedged, and whether they were primarily acting as a producer or wholesaler.

Requirement reports of large trader positions. Derivatives dealers and exchanges should report each entity that amasses a critical size of open positions in a market. The regulatory authority would compile this information from across markets in order to detect and deter market manipulation. This large trader reporting data has proven very useful by the Commodity Futures Trading Commission in the U.S. for the purpose of market surveillance.

The proprietary nature of the information should be protected by the regulatory authority, and the level of aggregation in the reporting of the information should further protect individual firms from having their market exposures or trading strategies exposed. This information would be compiled, and the non-proprietary data would be made available to the overall market so as to improve transparency. Once aggregated, this data would reflect the character of the market while protecting the details of dealers' market positions (assuming there are several dealers). The data of a proprietary nature would be retained by the regulator in order to detect and deter fraud, manipulation and potential systemic breaks in the markets.

The ability to enforcement reporting requirements can be enhanced by stipulating that any derivatives transaction that is not reported cannot be actionable in court for legal enforceability or bankruptcy claims. This provision will lead derivatives counterparties to thoroughly comply with reporting requirements in order to protect their interests in the contracts. Otherwise it amount to giving a counterparty an option to legally abrogate the obligations of the contract.

## **Capital and Collateral Requirements**

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<sup>30</sup> ) Most OTC derivatives transactions are traded through the ISDA Master Trading Agreement ("Master Agreement") which requires that the counterparties to the trades exchange confirmation messages to insure that all the key terms are understood.

Capital requirements should be updated for all financial institutions, especially derivatives dealers that might not otherwise be registered as a financial institution, so that the capital is held in an amount that is commensurate with not only the exposure to credit loss, but also potential future exposure and value at risk (VAR).<sup>31</sup>

Capital requirements can be used to limit the mismatch in currency composition or maturity on financial institutions assets and liabilities – measured to include both balance sheet and off-balance sheet positions. This will allow, but impose a prudential governor on, the pursuit of higher rates of return by taking on greater amounts of foreign currency and interest rate risk.

Capital serves two functions: first, it acts as a buffer when the firm suffers from an adverse event; and second, it limits to amount of a firm's risk taking in so far that the capital requirement is appropriately structured to be proportional to risk exposure. Capital requirements are critical to prevent the problems at one firm from becoming problems at another firm. This is especially important for dealers in financial markets because their failure can lead to market problems such as illiquidity (market freeze-up) or meltdown.

Require adequate and appropriate collateral (margin) to be posted and maintained on all derivatives transactions.<sup>32</sup> Collateral (margin) on transactions functions like capital does for financial institutions. It helps prevent the problems at one firm on in one transaction from causing performance problem for other transactions and other firms. In doing so it reduces the likelihood of default or other credit related losses, and it reducing the market's vulnerability to a freeze-up or meltdown.

The collateral rate should be adequate to cover short-term losses. There need not be a single rule for all derivatives in all markets. A high standard for collateral practice can be found in most futures and options exchanges around the world. Collateral should be in the form of cash or liquid government securities. Less liquid and more price volatile securities or assets should be discouraged if not prohibited. Alternatives such as performance bonds, letters of credit or surety bonds should be prohibited or discourages.

## **Orderly Market Rules**

Strictly prohibit fraud and manipulation and make it punishable by civil and criminal penalties. In order to protect the integrity of market prices so that they encourage the widest possible market participation and do not signal distorting signals throughout the economy, fraud and manipulation should be strictly prohibited and punishable by civil and criminal penalties.

Require derivatives dealers to act as market makers by maintaining binding bid and ask quotes through the trading day. This a common financial policy for exchanges and it is used in the OTC market for U.S Treasury securities.

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<sup>31</sup> ) Examples from the U.S. of non-financial firms acting as derivatives dealers include Enron, Williams, El Paso, and Duke energy corporations.

<sup>32</sup> ) For good background reading on collateral provision in OTC derivatives markets in the U.S., read Christian A. Johnson. 2002. *Over-The-Counter Derivatives: Documentation*. Bowne Publishing, New York.

Extend “know thy customer” rules to all financial institutions conducting derivatives transactions.<sup>33</sup> This provision will discourage fraud in the form of financial sharpsters “blowing-up” their customers. This regulatory provision already exists in some securities markets, and it should be extended to derivatives markets where there is even greater concern with asymmetric information or different levels of sophistication between market participants.

Impose position limits in derivatives markets. These restrictions amount to explicit limitations on risk taking, but not hedging. This measure can be very effective in limiting the amount of carry trade or “hot money” related transactions because they result in exchange rate exposure and sometimes interest rate exposure.

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<sup>33</sup> ) For descriptions of these structured securities and how they are transacted, see Frank Parnoy’s F.I.A.S.C.O. and Randall Dodd. 2002. “The Role of Derivatives in the East Asian Financial Crisis.” In Lance Taylor and John Eatwell (editors), International Capital Markets: Systems in Transition. Oxford University Press.

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