Chapter 10*

Derivatives – The Ultimate Financial Innovation

Viral Acharya, Menachem Brenner, Robert Engle, Anthony Lynch and Matthew Richardson

I. General Background and Cost-Benefit Analysis of Derivatives

Derivatives are financial contracts whose value is derived from some underlying asset. These assets can include equities and equity indices, bonds, loans, interest rates, exchange rates, commodities, residential and commercial mortgages, and even catastrophes like earthquakes and hurricanes. The contracts come in many forms, but the more common ones include options, forwards/futures and swaps. It is not an exaggeration to state that a considerable portion of financial innovation over the last 30 years has come from the emergence of derivative markets. EXCHANGE TRADED derivatives are dominated by equity derivatives and commodity derivatives. OTC derivatives are mainly in fixed income and currencies. Interest rate derivatives have a notional outstanding of $500 trillion while currency derivatives have a notional outstanding of $60 trillion. Total CDS notional outstanding is $50 trillion. The benefits of derivatives are threefold: (i) risk management, (ii) price discovery, and (iii) enhancement of liquidity. We briefly describe each of these in turn.

1. Benefits

This risk management (hedging) benefit of derivatives to a wide spectrum of economic agents has been recognized centuries ago. Two well-known examples are the Dojima rice futures market in 18th century Japan and the establishment of the CBOT in 1848 to trade forwards on agriculture commodities. Of course, the primary use of derivatives is to hedge one's positions i.e., to reduce or eliminate the risk inherent in commodities, foreign currencies and financial assets. Farmers who want to guarantee the prices of their future crop can sell them at any time in the futures or forward market. Exporters, exposed to foreign exchange risk, can reduce their risk using derivatives (forward, futures, and options). Pension funds who invest in securities can avoid disastrous consequences by buying insurance in the form of put options. The risk management benefits of derivatives are not limited to hedging one's exposure to risk but to a whole spectrum of risk-return combinations which can be achieved using options. For example, these features allow one to protect themselves in extremely volatile times like we are witnessing now.

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Another important benefit is the information that can be extracted from various derivatives. Price discovery is one aspect of it. Some examples include the ABX indices (i.e., portfolio of collateralized debt obligations (CDOs) of subprime mortgages) which were one of the first instruments to provide information to the marketplace on the deteriorating "subprime" securitization market[1]; exchange traded funds (i.e., ETFs) which provide information on the prices of securities ahead of the stale indexes (e.g., SPY vs. SPX); and option prices on individual equities which reveal private information more quickly into the market[2]. Derivatives also allow market participants to extract forward looking, as opposed to historical, information. For example, it is commonplace now to back out volatility, skewness (e.g., crash risk) and kurtosis (e.g., fat tails) of an underlying asset from option prices on that asset. Such information is used, among others, by central banks in making policy decisions, investors for risk and return decisions on their portfolios and corporations for managing financial risk. Another example is the expected Fed rate decision obtained from Fed Funds Futures.

An additional positive advantage is the enhancement of liquidity. Adding derivatives to an underlying market has two effects; (i) it brings to the market additional players who use the derivatives as a leveraged substitute to trading the underlying, and (ii) derivatives provide a hedge to market makers allowing a reduction in transactions costs through a lower bid-ask spread. By and large, spot markets with derivatives have more liquidity and thus lower transaction costs than markets without derivatives.
Given the above seemingly important benefits, why are derivatives, and especially credit derivatives, viewed so negatively in the current financial crisis?

We feel this opinion on derivatives is misguided. The problem is not with the derivatives as an instrument, but with (i) the way they were traded and cleared, and (ii) how they were used by some financial institutions to increase their exposure to certain asset classes. Before addressing specific examples of the credit derivatives market and the current crisis in Section II, we discuss some concerns about derivatives that arise quite generally.

2. Costs

In terms of the trading and clearing of derivatives, exchange traded derivatives are standardized (or quasi standardized) instruments that are marked to market where clearing and settlement is done by a clearing corporation. Though over the years there were some hic ups mainly due to attempts to corner the market, the exchanges managed to deal with them and improve the system. By and large, this arrangement has operated smoothly since the inception of derivatives trading (1848), no clearing corporation ever went bankrupt. Nowadays, clearing corporations are large and some clear for several exchanges (e.g. OCC and CME).

The main problems that have now surfaced, in force, are associated with OTC derivatives where the focus is on CDSs, but not limited to this derivative.[3] While the CDS market is large, the OTC

[1] A specific analysis of the price discovery function of the ABX index is provided in Gary Gorton, 2008, "The Panic of 2007", Yale working paper.
[2] See, for example, Sugato Chakravarty, Huseyin Gulen and Stewart Mayhew, 2005, "Informed Trading in Stock and Option Markets," Journal of Finance, 59: 1235-1258, and Jun Pan and Allen Poteshman, 2006, "The Information in Option Volume for Future Stock prices," Review of Financial Studies, 19: 871-908.
[3] Other recent examples are the exotic FX options scandal in Korea which was an OTC bi-lateral deal.

derivatives market has many other large markets (e.g. the FX derivatives market, the interest rate swaps market, among others). In general, the contracts are bilateral, typically with collateral depending on the type of contracts and the rating of the counterparty. Marking to market arrangements vary. In cases that one party has a big position, and a highly correlated product trades on an exchange, they may hedge their position with the exchange traded one (e.g., the well-known Mettalgesellschaft case in which they hedged a forward contract with futures, exposing them to basis risk). The advantage of OTC contracts is that they are tailor made which are important to entities who want to be perfectly hedged. That is, they can trade a big size without having a market impact, and they can have full anonymity. Unfortunately, this feature also describes the main problems, namely that these parties face (i) a potential lack of liquidity if they wish to liquidate their position, and (ii) counterparty risk.

Moreover, an issue that supersedes these two problems is the lack of transparency within the system. Unlike in the case of a central clearing house, no one knows precisely what the total exposure is, where it is concentrated, what are the values of such contracts, etc. These issues always exist but rarely surface as long as the sizes are small. However, when the sizes become large, and combined commitments are many times larger than the underlying, the lack of transparency makes the system prone to a systemic failure. Perhaps, the best known example from the recent past was LTCM. At the time of its collapse, LTCM had derivative positions with a notional outstanding value of over $1.25 trillion including swaps, futures and options. In contrast, only six banks had derivative positions greater than $1 trillion. And, in the current crisis, who could have known that AIG had written $400 billion worth of CDSs on AAA-tranched CDOs of mortgages, loans and bonds?

Regulatory oversight/jurisdiction is another important issue. Currently we have the CFTC, SEC and the Fed regulating exchange traded derivatives resulting in inefficiencies and the waste of valuable resources. In contrast, OTC derivatives are mostly unregulated, leading to regulatory arbitrage. This lack of regulation of OTC derivatives received a seal of approval by the passage of the Commodity Futures Modernization Act of 2000 (CFMA). In fact, a number of policy makers have argued that CFMA led to a number of serious deficiencies in the system, including Enron taking advantage of this legislation in some of its fraudulent accounting practices, and, perhaps more important, the unchecked growth of the CDS market.

A final comment on potential costs is that the complexity of some derivatives makes them open to abuses such as biased reporting by corporations and financial institutions, and misrepresentation of their risks to unsophisticated investors (e.g. some structured products). But complexity, like a lack of transparency, may also impose a negative externality on the financial system. When the financial system is hit by a significant shock, and there is a general flight to quality, complexity and lack of transparency in the system will amplify and speed up this flight, leading to a greater probability of systemic collapse, i.e., liquidity runs, death spirals, and so forth. From a societal point of view, all else held equal, complexity is a negative.

II. The Credit Derivatives Market and the Financial Crisis

A credit default swap (CDS) is simply an exchange of a fee in exchange for a payment if a credit default event occurs. In other words, it represents insurance against default. The buyer of

protection pays a fee (i.e., credit swap premium) each period, e.g., 75 basis points, until the maturity of the cds, or an occurrence of the credit event. If a credit event (e.g., bankruptcy, failure to pay, restructuring, etc…) occurs, then the buyer receives the difference between par value of a reference asset and its market value. Much like its predecessor, the interest rate swap and currency swap, CDSs were designed to allow market participants to hedge their credit risk. The growth in the market has been extraordinary. Figure 1 graphs the notional amount of outstanding CDSs in billions of dollars semi-annually over the period 2001– 2008. Ignoring the netting across contracts, the size of the CDS market grew from $631 billion outstanding in the first half of 2001 to $54.6 trillion in the first half of 2008.

While much has been made of the size of the market, and therefore by induction its contribution to the existing crisis, most of the outstanding CDSs derive from the investment grade and high yield corporate bond markets. As defaults in the corporate bond market occur, exposure to these CDSs may become an issue. But to this date, the CDSs that have contributed to the writedowns in the current financial crisis have been those referencing residential mortgage backed securities (RMBS), commercial mortgage backed securities (CMBS) and collateralized debt obligations (CDOs). These CDSs represent only a small fraction of outstanding notional amounts. In contrast to corporate CDSs, the motivation for the CDSs referenced against asset-backed securities is one of guaranteeing the defaults on these securities or slices of these securities (i.e., tranches).

In particular, RMBSs, CMBSs and CDOs are securities backed by pools of debt, usually mortgages, bonds or loans. These securities are often tranched. For example, a typical structure might have four tranches, the first of which (the so-called equity tranche) would absorb the initial losses, the next tranche absorbing the losses after the equity tranche fully defaults, and so on, until the final AAA-tranche which only has to pay off after all the previous tranches are depleted. Figure 2 shows the issuance in the CDO market from 2001 to 2008. For example, mortgage-backed CDOs issuance went from $28 billion in the 1st quarter of 2005 to $94 billion in the 2nd quarter of 2007 until the market collapsed thereafter as the subprime crisis developed. A common CDS on these CDOs was to cover any losses of their AAA-tranche. It was these securities that were at the epicenter of the current financial crisis.

1. Benefits

Without access to credit derivatives, lenders would not be able to hedge their risk and expand the market for credit. That is, without hedging, lenders would not be willing to supply a large number of loans at their fundamental prices and instead would demand an extra premium as the supply of loans increased. It can be argued that banks fared quite well during the 2001 recession with the economy's high rate of defaults because of the bank's ability to lay off the credit risk of their loans to capital markets. Even in the current crisis, there are a number of examples of the benefits of CDSs. For instance, JP Morgan Chase is a major participant in the leveraged loan market. One of the ways they expand the loan market is to take the loans, pool them to form CDOs, and then sell off these CDOs to a clientele of investors willing to purchase them. When the CDO market shut down in July of 2007, it meant that JP Morgan was left holding a large number of leveraged loans on their books that were intended for the securitization market. This dramatically increased their exposure to credit in what was becoming a high risk environment. JP Morgan, however, was able to employ CDSs to reduce their

exposure. Ex post, this was a good strategy as credit market conditions deteriorated rapidly over the next year, putting other non-hedged financial institutions at risk.

CDOs have been greatly criticized as "derivatives gone wild". But the truth is that these securities allowed an expansion of credit markets by spreading the credit risk across a wide variety of global investors and away from capital constrained financial institutions. This helps make the credit reflect their true economic value (and not demand/supply imbalances), namely the probability of default, recovery in default, and any aggregate risk premiums associated with default. This expansion of credit enabled individuals to access the subprime or Alt-A mortgage market, and companies to issue high yield bonds or leveraged loans for efficient recapitalizations or capital investments. The fact that a shock to the fundamentals of the economy, i.e., the burst of the housing bubble and a more general economic downturn, led to credit losses should not have caused a financial crisis. The problem, of course, was that this credit was not sufficiently sold to investors, but instead was held on the bank's balance sheets. In other words, the issue was not with the derivatives, but how they were misused in practice.

In addition, during the current crisis, CDSs and other credit derivatives have played a very important role in disseminating information to both the public and to regulators. Due to the complexity of financial firms' capital structures, it is difficult to infer general credit quality from the secondary market in underlying bonds, especially given that some of the bonds rarely trade. In contrast, from very early on during the financial crisis, the CDS market has judged the quality of financial firm's bankruptcy prospects in a remarkably prescient way. As an example, consider the following seven financial institutions from the onset of the crisis in July 2007 to November 2008, namely AIG, Citigroup, Bear Stearns, Lehman Brothers, Merrill Lynch, Morgan Stanley and Goldman Sachs. Figure 3 graphs their CDS premiums on a monthly basis in comparison to the other evaluator of credit, the ratings agencies. As can be seen from the figure, the market very early on figured out that the financial institutions had become much riskier due to the onset of systemic risk.

2. Costs

As illustrated by Figures 1 and 2, the CDS and CDO markets had grown to well over $50 trillion in notional amounts. Yet there was a complete lack of transparency about the underlying exposures of financial institutions to this market. For example, the central idea of securitization is to pool relatively illiquid loans – mortgages, corporate bonds and bank loans – that banks have trouble keeping on their balance sheets into more liquid CDOs that would then be passed on to a wide variety of investors willing to assume the risks. The surprising part of this crisis, however, is that these securities were held in large amounts by commercial and investment banks. As housing prices started falling and subprime mortgages began to default, CDOs began to lose value, and financial institutions began to suffer large writedowns. As it became clear that many highly levered financial institutions, some at unprecedented ratios, were highly exposed to these derivatives, counterparty uncertainty in the OTC market spread through the system, causing systemic risk to spread.

For example, on March 14th, as Bear Stearns was on the brink of bankruptcy, Figure 3 shows that CDS spreads of financial institutions jumped. As a result of this contagion, the government engineered a bailout of Bear Stearns by guaranteeing $29 billion worth of subprime-backed securities and its sale to JP Morgan. Some months later, however, as credit markets

deteriorated and moved beyond subprime-backed securities, Lehman Brothers declared bankruptcy on September 15th, leading to systemic pressure on AIG, the Reserve Primary Fund, and then Morgan Stanley and Goldman Sachs, resulting in the government bailing out the entire financial system. Transparency (or lack thereof) was the common characteristic of these funds – the market, and certainly regulators, were unaware of AIG's $400 billion one-sided exposure to CDSs on CDOs, of the Reserve Primary Fund's massive exposure to Lehman short-term debt, and ultimately the credit exposures of Morgan Stanley and Goldman Sachs.

While transparency of the derivatives market is a major issue, its effect is amplified by the complexity of credit derivatives.[4] In stating their complexity, however, it is useful to separate out CDSs on corporate bonds from CDSs on CDOs, the latter being much more complicated. As the market for credit derivatives took off rapidly after 2001, its growth closely mirrored a related market, the collateralized mortgage obligations (CMO) market, in the mid 1990's. Both these markets got away from their initial purpose, creating more and more complex structures, e.g., the Interest Only (IO) Z-tranche of a 50-tranche structure for CMOs versus the synthetic CDO-squareds of the current crisis. Both markets went through a significant shock, e.g, the 200bps interest rate move in 1994 versus the 20% housing price drop in 2006-2007, and both markets collapsed shortly thereafter. Eventually, the CMO market came back completely albeit in a much more simple form with a well-developed investor base. One might expect the CDO market to come back similarly if allowed the opportunity.

Even for the simplest form of CDOs, there are still three outstanding issues, all of which were severely missed by the rating agencies and, apparently, by some of the leading financial institutions in the securitization business.[5] First, on an ex ante basis, the assumptions seemed very poor. Some examples include little or no modeling of the affect of a housing decline on defaults even though "local" evidence showed such a relationship and ample discussion of a housing bubble; no modeling of lower recovery rates on loans even though loans were no longer at the very highest priority of the capital structure; and so forth. Second, the assumptions did not take account of the adverse selection and moral hazard created by securitization, namely that securitization reduces the incentive to provide high quality loans and then monitor them, respectively. Third, the correlation and recovery structure of the loans, the key ingredients to CDOs, were simple inputs to the modeling structures. All of these will have to be improved moving forward.

Even if the issues of transparency and complexity, however, were solved, it is still not clear that the problem of systemic risk would be solved. Each financial institution and market participants will act in their own interest to manage their risk/return tradeoff. These actions may not take into account the spillover risk throughout the system. Therefore, there is a role for the regulation of OTC derivatives. At a minimum, this would mean the regulator could use the information on the firm's exposure to derivatives and then employ the tools discussed elsewhere in these white papers to "tax" or reduce the systemic risk in the system. At a maximum, this might involve regulation along the lines seen either with exchange-traded derivatives (a la the CFTC) or traded securities more generally like stocks and bonds (a la the SEC). At face value, other than one-off, customer specific OTC derivatives which may be too

[4] See Chapter 1: Mortgage Origination and Securitization in the Financial Crisis.

[5] See Chapter 3: The Rating Agencies: Is Regulation the Answer?

unwieldly and costly to monitor, there appears to be no reason for the lack of regulation of more standardized OTC derivatives. Derivatives are not particularly special - securities should (???) either be regulated or not.[6]

III. Principles of Regulating Derivatives

The most important principle underlying the regulation of derivatives must encircle three primary issues: (i) uncertain counterparty credit risk exposure which can generate illiquidity and can cause markets to break down, (ii) capital erosion which can cause the financial system to break down if the erosion is large and concentrated in institutions that provide liquidity to the financial system, and (iii) prices that are away from fundamentals due to illiquidity in the market, which can cause distortions in capital allocation.

Since the most important component for understanding counterparty credit risk is the level of transparency, any regulatory action should explicitly be organized around increasing the level of transparency to, at the very least, the regulator. In fact, real-time availability of prices, volumes and positions at the trade level to regulators is unambiguously beneficial so long as the costs associated with gathering and processing the information are not prohibitive. This information will allow regulators to manage systemic risk in the financial system. For example, AIG's $400 billion worth of exposure to credit defaults across markets presumably would have alerted regulators.

There are, of course, also strong benefits to providing transparency to the public as well. Regulators may not always be able to monitor or understand the exposures. The market may discipline the counterparties in question. For example, would Goldman Sachs, Merrill Lynch and others have entered into agreements with AIG knowing the degree to which AIG was exposed similarly to all its counterparties? Unlike with regulators, unfettered transparency of prices, volumes and positions to the public at large involve a tradeoff. On the positive side, greater transparency will help limit the risk externality created by counterparty credit risk. On the negative side, transparency may be onerous for institutions since it may (i) reveal their trading strategies, and (ii) it may reduce their inclination to trade, and thereby also affect liquidity in an adverse manner. Moreover, there are costs to collecting and processing information, which are likely higher in more diffuse markets such as the swaps market and lower in more concentrated markets such as the CDS where there are only around 25 key players.

IV. Regulation of Derivatives – Some Suggestions

As stated above, the primary regulatory issue is that lack of transparency in the market for OTC derivatives can cause (i) uncertain counterparty credit risk which may cause markets to shutdown, (ii) capital erosion of a major financial institution that leads to a ripple effect across the financial system and a loss of liquidity services, or, (iii) prices that are away from

[6] One argument against regulation might be the regulatory arbitrage that can take place internationally. As mentioned throughout these white papers, international coordination is an important element of any reform.

fundamentals due to illiquidity in the market, which can cause distortions in capital allocation. The following suggestions are organized to address this and also some secondary concerns.

1. A Central Clearing House

The main reason for systemic risk in OTC markets is that bilaterally set collateral and margin requirements in OTC trading do not take account of the counterparty risk externality that each trade imposes on the rest of the system, allowing systemically important exposures to be built up without sufficient capital to mitigate associated risks. The top part of Figure 4 shows the interaction of six financial institutions in an OTC market. There are a total of 15 possible bilateral transactions taking place in the market. Without additional information, it is not possible for a counterparty to know the overall credit risk of the other counterparty they are trading with. This is not just because of their four other transactions shown in Figure 4, but also the transactions between other counterparties that might put the system at risk. As a solution to this problem, therefore, OTC markets that grow "sufficiently large" should be migrated to Clearing House and Exchange market structures. With appropriate collateral and margin requirements, these structures have little to no counterparty credit risk. The lower part of Figure 4 illustrates this mechanism where now there are just 6 transactions, one for each counterparty, with a common intermediary, the central clearing house.

In general, new instruments will almost always start off being traded in an OTC market before moving to a Registry structure as the market for these instruments grows larger. As this growth occurs and standardization becomes easier to implement, the instruments will move to either a Clearing House structure or an Exchange structure. Chapter 11, "From Over-the-Counter to Centralized Clearing – the Case of Credit Derivatives", explains these arguments in more detail. The chapter makes several suggestions with respect to market structures. First, standardized products such as credit default swaps (CDS) on corporate or credit indices should be considered for migration to exchange-based trading where well-capitalized market-makers provide liquidity. The clearinghouse of the exchange acts as a counterparty to all trades and provides transparency in terms of aggregated or trade-level price and volume information. Second, OTC markets which may be important for counterparty risk but that are small in nature should be subject to a centralized registry. Third, regardless of the market structure (OTC without a registry, centralized registry, centralized counterparty, or exchange), regulators should have access to information on bilateral positions. Fourth, given the binary nature of default events, collateral and margining arrangements based on daily marking-to-market should be carefully designed to ensure minimal counterparty risk of centralized counterparties in credit derivatives, recognizing that some counterparty risk may be unavoidable.

2. Transparency

Transparency of all information for regulators is necessary. In the event of systemic stress, regulators ought to have this information to assess the damage to the financial system of letting a counterparty fail. For the Clearing House and Exchange market structures mentioned above, the regulators (and the public) can obtain this information in real time. For the Registry market structure, this information can easily be made available to regulators by the registry at the end of each trading day. For OTC markets, counterparties to any trade must report asset terms, price and volume information in a timely manner to the regulatory body charged with managing systemic risk in the financial system.

Transparency of all information for registries, clearing houses and exchanges is also necessary. Registries, clearing houses and exchanges need this information to proactively limit counterparty credit risk through the setting of margin and collateral requirements. For the Clearing House and Exchange market structures, this information is available to the relevant clearing house or exchange in real time. For the Registry market structure, this information is obtained by the registry at the end of each trading day as a matter of course. But it may be better to require that the parties to any trade report asset terms, price and volume information in a more timely manner to the registry.

Transparency for the public of trade-level information on volume and prices in real time without revealing who is trading also seems reasonable. This is a feature of most markets and is now a feature of the corporate bond market which was hitherto entirely OTC but now has trade-level disclosure to TRACE. For example, the CDS market for corporate bonds is a natural OTC market that a TRACE-like system seems appropriate. Real-time public transparency of prices and volumes at the trade level is unambiguously beneficial for small trades (since it ensures smoother revelation of information into prices and more orderly liquidation of positions, which both lower volatility) but involves tradeoffs for large trades (since revealing the volume may reveal who is trading). As a solution for large trades, the TRACE system reports the trade price, but does not reveal the volume. The tradeoff is the cost of revealing the volume of a large trade makes it easier for market participants to determine the parties to the trade against the benefit of revealing the volume of a large trade aids the dissemination of information into prices.

Finally, does the market need public transparency of positions? The exact level of transparency that is desirable is a function of the exact nature of margining/collateralization associated with the market structure in place. In particular, less transparency is needed as better margining/collateralization drives counterparty credit toward zero. In particular, if the margining and collateralization requirements that are put in place are able to reduce counterparty credit risk to zero, there is little need for public transparency of positions since such transparency does not help manage systemic risk in the financial system. For Clearing House and Exchange market structures, since there is little to no counterparty credit risk with these market structures, there is little to no need for public revelation of positions held by market participants. For the OTC and Registry market structures, however, since there is substantial counterparty credit risk with these market structures, there is a need for transparency of positions for the public.

The timing and frequency of the public revelation of positions can be used to manage and reduce the costs of public revelation of positions. In terms of timing, if a participant has a large position and needs to unwind his position, and other parties were to know about this position, then these parties could take advantage if the position is revealed in real time. Therefore, a lag between the date of the position snapshot and its public revelation may limit the ability of other parties to take advantage of participants with large position exposures. The analogous mechanism would be the delayed 13-F filings by institutions of their long positions in equity and bonds. In terms of frequency, frequent public snapshots of a participant's positions, even with a lag, allow other market participants to infer that participant's trading strategy. Reducing the frequency of the snapshots makes it more difficult to use those snapshots to infer a player's trading strategy.

Lastly, what form would this transparency of positions take? Would transparency of positions be trade by trade or would there be some aggregation, and would this aggregation be bilateral (i.e., knowing all of a party's positions in a security and the counterparty for each position) or institutional (i.e., knowing only a party's net position in a security)? While bilateral aggregation would allow counterparty credit risk to be more accurately assessed, it might reveal how various participants are providing liquidity to the market.

3. Oversight of Derivatives

As a backdrop, consider the past and current regulatory environment. The Commodity Exchange Act (CEA) of 1936 was enacted to deal with manipulation and cornering attempts in agricultural futures. The act did not cover forward contracts that were considered cash sales. This was changed in 1974 with the act that created the Commodity and Futures Trading Commission (CFTC). This act has actually expanded the range of derivatives that CEA applies to. The definition of "commodity" now includes "all other goods and articles….in which contracts for future delivery are presently or in the future dealt in". Moreover, all derivatives contracts had to be traded on futures exchanges. As stated above, this requirement excluded forward contracts where actual delivery was taking place. The other exclusion, provided by the Treasury Amendment (to the same act), were OTC derivatives based on foreign exchange or U.S. Treasury securities. In the 1980s, interest rate and currency swaps were created with an unclear regulatory status. As a result, in 1989, the CFTC issued a swaps exemption, and, in 1993, it issued an exemption for OTC derivatives on energy products. In 1998, the CFTC was considering modifying the regulation of the OTC market but, in November 1999, the President's Working Group on Financial Markets recommended that essentially financial OTC derivatives should be excluded from the CEA and from the CFTC's jurisdiction. Based on this, the Commodity Futures Modernization Act of 2000 (CFMA) stated that OTC financial derivatives were not subject to the CEA as long as they were not marketed to small investors. Thus, as long as credit derivatives, for example, are not marketed to small investors, they are exempt from regulation. If an exchange was formed to trade such derivatives, however, they would fall under the Jurisdiction of the CFTC.

This latter distinction is not particularly logical especially in the context of whether derivatives are a possible contributor towards systemic risk for the reasons described in section I.B and 2.B above. Therefore, it seems perfectly reasonable that there should be consistent regulation across derivatives. This would require an agreed upon set of rules for all derivatives. A natural place to start would be to apply similar requirements to that of the exchange traded market. For example, alerting potential participants to the risks and complexity of derivative products would fall into this category. Of course, one of the attractive features of the OTC derivatives market is its flexibility and customer-specific derivative contracts. It may well be the case that the OTC derivatives market might have to reach a particular threshold, either in volume or transaction size to fall into the class of regulated securities.

An even deeper issue is whether derivatives should be treated differently than any other securities. Because derivatives are usually claims on underlying securities, such as equities, bonds and loans, there is not a big difference economically between the underlying and the derivative. In fact, the fundamental basis behind the valuation of many derivatives is dynamic trading of the underlying and a riskless security. It is not clear, therefore, why the regulatory treatment of derivatives should be different than other securities. This would suggest a single

regulatory agency that would cover all securities, in other words, a combination of the Securities and Exchange Commission (SEC) and the CFTC. One ancillary benefit is that this by construction would end the infamous turf battles of these two commissions.

Figure-1: Outstanding CDS (Notional)

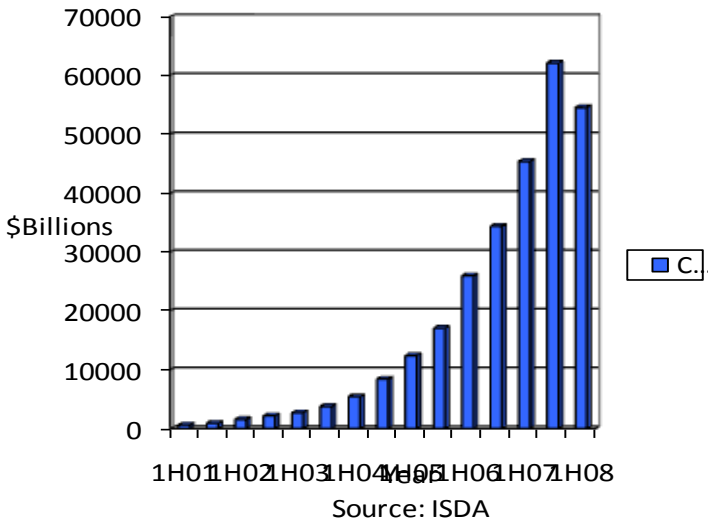


Figure-2: CDO Issuance ($millions)

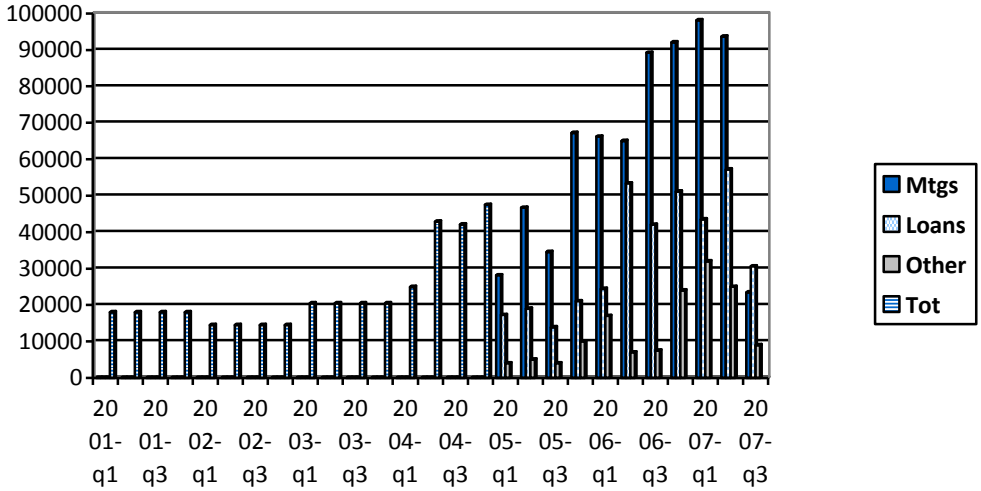
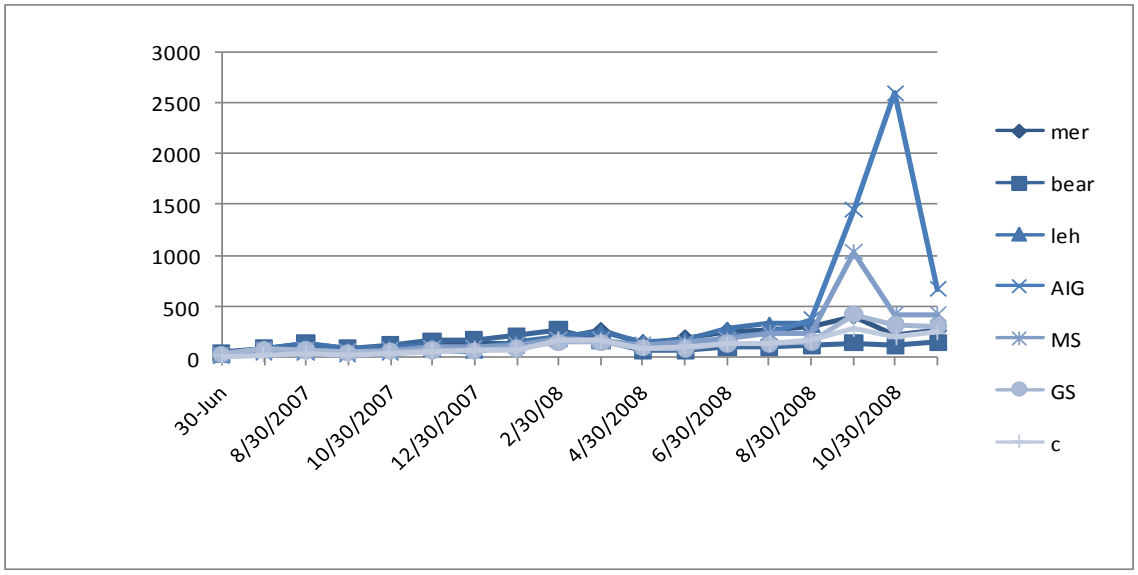


Figure- 3 : CDS Premiums & Ratings of Financial Institutions (July 2007-November 2008)



Ratings History (end of month) 6/07-11/08
Bear Stearns A+ 6/07, A 11/07, BBB 3/08, AA- 4/08
Lehman A+ 6/07, A 6/08, neg watch 9/08
Merrill Lynch AA- 6/07, A+ 10/07, A 6/08
A.I.G. AA 6/07, AA- 5/08, A- 10/08
Citi AA 6/07, AA- 11/07, neg watch 4/08 and 9/08
Morgan Stanley AA- 6/07, A+ 6/08
Goldman Sachs AA- 6/07

Figure-4: OTC Versus Central Clearing House