Credit Derivatives: Macro-Risk Issues

Credit Derivatives, Macro Risks, and Systemic Risks

by
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Abstract

In this paper, some of the “bigger picture” risks associated with credit derivatives are explored. After drawing a distinction between the market’s perception of credit and “real credit” as reflected in the formal definition of a “credit event”, an examination of the macro drivers of credit generally (which might then prove to be one of the catalysts for larger scale concerns with credit derivatives) is undertaken; these have been fairly well researched and documented. Next, the most frequently cited concerns with the modern credit derivative marketplace are enumerated: the exceedingly large notional traded in credit default swaps alone relative to (i.e., integer multiples of) the outstanding supply of debt (bonds and loans) in any single name, the increasing involvement of the hedge fund community in these products, and the operational concerns (lack of timely confirmations,…) which have come to light (and been publicly and roundly criticized) in the last year or two. The possibilities of associated systemic risk are subsequently considered.

Credit derivatives deal with risk, involve the transfer of risk, and are, potentially, risky in and of themselves. As in any “new”market, there have been some “glitches”; some of these issues have already been addressed by the market participants and some of these entail the evolving modelling of these instruments. A brief look at the auto downgrade in March 2005 resulted in some “surprises”; part of the concern with these new (and sometimes complex) credit derivative instruments is their proper hedging, risk management, and valuation.

That said, the credit derivative markets continue to grow rapidly as people find practical and beneficial uses for these hedging, income-generating, and replicating instruments; these products allow for a wider distribution of credit risk among a broader institutional base; and evolving market practices and safeguards on the part of those involved in this burgeoning area should help to establish a more efficient and more transparent marketplace. Whether credit risk is best allocated outside of the traditional financial intermediaries remains an open question.

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Derivatives: The "D" Word

In the early to mid-1990s, derivatives received a great deal of negative publicity in the popular media. Several unfortunate incidents ultimately led Gary Gastineau and Mark Kritzman, in the revised edition of their Dictionary of Financial Risk Management, to define a "derivative" as, "(i)n the financial press, anything that loses money."[1]

The proximate causes of these derivatives disasters were attributable to a variety of factors: Metalgesellschaft experienced a cash flow mismatch between long-term OTC forward contracts and marked-to-market short-term exchange-traded futures; Gibson Greeting was encouraged to enter into complex, and probably inappropriate, financial transactions that they apparently didn't fully understand; Proctor & Gamble and Robert Citron of Orange County assumed significant investment risk, exacerbated by a "surprise" interest rate hike; Barings Bank employed a rogue trader who was able to engage in fraud due to the lack of institutional risk control; and, of course, LTCM – where just about everything went wrong. Many of these incidents were highlighted prominently soon thereafter in books with titles such as Derivatives: The Wild Beast of Finance.[2]

At least one market participant (i.e., one investment bank) felt that the label "derivatives" was so detrimental that they renamed their offerings "risk management products." Many remain skeptical of the value that derivatives can provide; one hedge fund manager (speaking to a group of summer M.B.A. interns at an investment bank in New York a couple of years ago), when asked if he used options as part of his investment strategy, replied, "I don't go to that crack house."

The (interest rate) swap market has only been around for about 25 years, yet it is one of the largest and, arguably, one of the most important and successful financial markets in the world. Credit derivatives are much newer – having been first publicly introduced by ISDA[3] in 1992, but, practically, not broadly traded until after the standardization of the documentation in 1999.

What about "credit"? The origin of the word, as our Classics scholars know, comes from the Latin – proximately from the word "creditum" (meaning "loan") and ultimately stemming from "credere" ("to entrust") and "credo" ("I believe") – which, for our purposes, is what every bank or lender does (in terms of expecting to be paid back with interest), and, more generally, what every counterparty expects (in terms of performance), when they enter into an over-the-counter derivative contract. There is nothing new about lending and borrowing, though James Grant has chronicled the alleged long term relaxation, and accompanying deterioration, of credit practices in the United States.[4] Chacko, Sjoman, Motohashi, and Dessain go one step further – identifying credit risk as a "disease": "it makes you uneasy, queasy, almost to the point of nausea. Well, we are here to inform you that you have just been infected with the Credit Risk virus. And you won't be cured until the money is safely returned. In the modern world, this is a virus as ordinary as the common cold."[5] Jennifer Ryan and Hamish Risk of Bloomberg refer to the "predicament" relating to credit derivatives as "akin to battling a rare disease"[6] (at least rare thus far). Others have used expressions like "contagious" and "cancerous growths" in their descriptions of these instruments.

What happens when you combine wild beasts with some ubiquitous, virulent pathogen? Avian flu? No,…Credit derivatives! Who wouldn't be scared?

When the topic for this session was first proposed, the distinction between macro risks and systemic risks initially struck me as quite different. I would like to address the first (on which, I believe, there has been a fair amount of both academic and practitioner research, and to which I will only dedicate something of an overview) and then transition to the second set of risks (which, I believe, constitute the actual issues relevant for the policy discussions to be subsequently addressed here).

Credit Derivatives and Macro Risks

When one thinks of macro risks, what come to mind are exposures to changes in those aggregate or fundamental economic factors that could impact the economy as a whole in general and/or the financial markets and the banking sector in particular.

Before considering the "macro risks" which might impact the credit markets, a distinction should be drawn – one that I heard made by a credit derivative marketmaker a few years ago. He pointed out that, while trading credit derivatives is surely "trading credit", there is a difference between trading the market's perception of credit (as realized in corporate and some sovereign bond spreads) and trading "real" credit. By "real credit", he meant trading instruments which are "triggered", not by the possible likelihood of bankruptcy, not by changes in default probabilities, recovery rates, credit ratings nor by changes in those ratings, not by any other circumstances which may influence the market price of credit risk in any particular name, but by the actual act of filing for bankruptcy, by missing payments on borrowed money, by debt repudiation or moratorium, or by restructuring under financial duress. In other words, trading instruments which "kick in" when one comes to "not believe" in the ability and willingness to repay debt on the part of some institution. Of course, one would like to think that there is a fairly close correlation between these two types of "credits", and that the marketplace would respond

by providing financial capital to what is perceived to be a potentially rewarding arbitrage strategy between the two (capital structure arbitrage currently being one of the fastest growing of the hedge fund strategies out there), but the distinction between real credit and perceived credit is not trivial … as most commonly seen reflected in the presence of (or absence of) total returns swaps for corporate securities in (from) the catalogue of credit derivatives.[7]

What's in a name? Insurance or Derivative?

One of the fundamental reasons for the success (or at least one of the reasons for the popularity) of credit derivatives is their ability to separate the hedging or acquisition of credit risk from the traditional vehicles which have allowed a position in credit (i.e., bonds and loans). Credit derivatives are often likened to "financial credit insurance" (and, indeed, they have been referred to in that manner[8] and certainly can be utilized in that way), even if the N.A.I.C. (National Association of Insurance Commissioners) constantly reminds derivative salespeople (and their Compliance Departments) that they cannot market derivatives as "insurance" – as that is a unique product, separate from financial contracts, swaps, forwards, futures, and options.[9]

Obviously, investment banks which have lending relationships with corporates and sovereigns welcome the ability to lay off credit risk without the consent, or even the knowledge, of their counterparties. This goes to the very heart of relationship banking. Moreover, thanks to credit derivatives, these banks have embraced the relaxation of capital requirements previously imposed on the traditional lending businesses.

Consideration of macro risks for credit derivatives raises three issues. The first is whether the ability to lay off credit risk has influenced the activities associated with bank lending or capital market issuance practices. The second is whether macroeconomic factors might act as catalysts

in initiating wide-spread credit crises and their associated implications for credit derivative markets. The third is whether the greater dispersion of credit risk in the economy among a broader class of firms, investors, and institutions is a positive and stabilizing development.

Credit Derivatives and Lending Behavior: Moral Hazard?

The first question asks whether lending practices have changed in light of the new credit risk management products. This addresses the ability to lend, the willingness to lend, and possibly the degree of thoroughness contained in the process of due diligence which has typically attended most bank lending activities. We tend to use the expression "moral hazard" technically to refer to a situation in which there arises an additional or heightened risk, due to the presence of a contract or mitigating arrangement, which subsequently causes a relaxation in the behavior of one of the naturally risk-averse parties involved with respect to their efforts to avoid a negative underlying outcome. The prototypical example of a market instance of this phenomenon is, not surprisingly, insurance; of course, knowledge that one possesses "fire insurance" on the part of, say, homeowners may reduce their actions and expenditures to keep their domiciles free from circumstances of inadvertent combustion. Malcolm Gladwell summarized this nicely:

> "Insurance can have the paradoxical effect of producing risky and wasteful behavior. Economists spend a great deal of time thinking about such moral hazard for good reason. Insurance is an attempt to make human life safer and more secure. But, if those efforts can backfire and produce riskier behavior, providing insurance becomes a much more complicated and problematic endeavor."[10]

Have banks really become less cautious in their lending behavior? There are a number of factors which make this more of a discussion point than a well-posed question in search of a definitive answer. Recent advances in banking deregulation, the Basel Accords, modernization of financial markets, the evolving role of financial institutions, consolidation in the banking (and especially the investment banking) industry, heightened competition, collapsing spreads,

innovative products and new technology,… all add noise to the question at hand.

That said, Dr. Nout Wellink, President of Netherlands Bank and Chairman of the Basel Committee on Banking Supervision, properly pointed out this past February at the GARP 2007 Annual Risk Management Convention and Exhibition in New York,

> "(T)he role of banks as the ultimate holders of credit assets has become less important. … We are therefore witnessing a fundamental change in the business of banking from buy and hold strategies to so-called 'originate-to-distribute' models."[11]

There have been claims that the current state of credit markets have been altered by the existence and infusion of credit derivatives. More specifically, it's been posited that traditional lenders have become less concerned with the accurate credit quality assessment of their borrowers as they, through the use of credit derivatives, will no longer be the ones "holding the bag" when the ultimate creditors "cease to believe". John Plender tells us,

> "If the real worry is systemic risk, a more fundamental threat comes from the change in the structure of the banking industry whereby credit risk is packaged into tradeable IOUs or hedged via credit derivatives and shunted off bank balance sheets. Yet…moral hazard …, complete with the marked decline in risk premiums and in lending standards, is the story of credit markets this decade. The mechanics of moral hazard in the exponentially growing newer financial markets entail the destruction of the old relationship between banker and borrower. This is because banks no longer retain the credit risk in much of their lending. They originate and distribute; and where the intention is to distribute, the lender is inevitably less bothered about loan quality."[12]

With the recent events in the sub-prime lending market (which, I believe, have little to do with credit derivatives), one could argue that this situation may have resulted simply from a turn in the credit cycle and housing market, and attach no greater significance than that. The ability to minimize financial fluctuations and lessen price volatility are typically not included among the benefits associated with free markets. Was the unprecedented level of sub-prime lending a result of a change in the market's appetite for credit risk, a reflection of the influx of ready, new investors into this area, or simply an error on the part of those who assessed the risks in this

case? Those who sing the praises of free markets usually assert that, while markets are not always correct and can frequently be "wrong", they are generally not stupid.

There may be a more subtle dynamic at work in this context. Christopher Whalen reports,

> "In the age of derivatives-enabled structured finance, the term "private equity" has become passé. Nearly every financial buyer deal we see coming to market involves a large degree of debt finance, regardless of the type of sponsor. Looking at the staggering numbers for public and private bond issuance in 2006, measured in the trillions of dollars, it seems clear to us, at least, that OTC derivatives and kindred structures like collateralized debt obligations [CDO] are driving a process whereby assets are being packaged and sold at prices that understate the true economic risk."[13]

One last thought. Knowing that insurance is available is quite different from having a policy "in hand"; it is not wise to wait until flames are coming from the roof to seek an insurance quote. The issue of liquidity will be explored later.

Debt: The Big Picture

Currently, the United States is seriously in debt. On an aggregate level, U.S. households "owe", on average, 122% of their net national income. National debt is ready to top nine trillion dollars (and does not include future Social Security and future Medicare liabilities). Corporate debt is at an all-time high; business-sector and financial-sector debt exceeds twenty-three trillion. Moreover, the U.S. is relying on significant amounts of foreign funding; by the end of the third quarter of 2006, the U.S. had borrowed in excess of USD 860 billion (around 6.5% of GDP) from abroad to finance its expenditures; BusinessWeek predicts it will add more than 6% in 2007. Overall, the debt of the United States was estimated (at the end of 2006) at 48.4 trillion dollars. The question that begs answering is whether there have been any changes in the banking system, lending markets, regulatory framework, or institutional landscape to warrant this explosion in credit risk. The presence of credit derivatives is probably not the driving factor behind all this.

Macro Risks and Contagion

The second "macro" issue is the extent of the potential impact of changes in the credit cycle and the ability of the system and the market participants to handle such changes. By analogy, if the government were to put something "into the water" which drove the death rate to zero, the life insurance business, you'd think, would become extremely stable and relatively uninteresting; no one, or at least no one who knew what was in the water, would subsequently refer to this industry as "risky". Insurance companies would collect the premiums and never need to make a payout. If there were no bankruptcies, defaults, repudiations, or need for restructuring, credit markets (and credit derivative contracts in particular) would be dull and uninteresting. In the end, it will be credit events that test these products, contracts, markets, and institutions.

If credit derivatives are "triggered" by credit events, then, on a macro scale, we might want to consider what tends to influence the incidence of these events. Neal and Rolph tell us,

> "Credit risk is influenced by both business cycles and firm-specific events. Credit risk typically declines during economic expansions because strong earnings keep overall default rates low. Credit risk increases during economic contractions because earnings deteriorate, making it more difficult to repay loans or make bond payments. Firm-specific credit risk is unrelated to business cycles"[14]

Credit derivative modelling will be looked at in more detail later, but some credit models have incorporated aggregate economic variables as potential explanatory drivers of credit conditions. For example, Satyajit Das identifies the model developed by McKinsey and Company (under Tom Wilson) as one in which macro variables play a primary role: "The model focuses on the risk of a credit portfolio explicitly linking credit default and credit migration behaviour to the macro-economic factors that are major drivers of the credit quality of the portfolio."[15] Although one might think that inclusion of these macro variables could enhance/improve credit analysis, Das informs us that "(i)n practice, the increasingly favoured models are *reduced form models*."[16]

There is no shortage of academic or practitioner research attempting to identify and evaluate those discernable variables which influence the number and severity of bankruptcies, defaults,… While it is intuitive that economic downturns would generally coincide with the incidence of credit events, we can ask what macroeconomic factors in particular are the most significant in that context.

Ed Altman, a Professor of Finance at New York University's Stern School of Business and one of the foremost authorities on credit, bankruptcy, and defaults, and others have incorporated various macro factors into their credit models and analyses, and have attempted to evaluate the importance of those variables. These have included: the level of interest rates, leverage, inflation, unemployment, aggregate measures of indebtedness, nominal and real GDP growth rates, changes in those growth rates, savings rates, liquidity premiums, the ratio of high yield debt to total debt outstanding, returns (and changes in returns) of aggregate equity indices, and, in a few cases[17], a single systematic factor referred to as "the state of the economy". The inclusion of these factors is intended to capture the drivers of "the probability of default" and/or "the recovery rate" (or, conversely, "loss given default") in the event of bankruptcy/default. In some instances, these variables are examined in conjunction with a number of other firm-specific factors such as industry or sector, geography,… as well as more traditional credit indicators like the degree of corporate leverage, the ratio of free operating cash flow to total debt, and EBIT or EBITDA interest coverage multiples.

Interestingly, in examining the empirical importance of macroeconomic variables which, Altman relates, have been recognized as statistically significant in the work of others, he finds in his studies that they add little in terms of explanatory power or incremental statistical significance.[18]

The open state of this research is reflected in the current work of Professor John Binder of the University of Illinois - Chicago, who has recently found a counterintuitive positive empirical relationship between probability of default and recovery rates.[19] Furthermore, in a recent telephone conversation with a senior risk manager at a large, high-profile hedge fund, an unsolicited belief was articulated in support of the notion that default probabilities and recovery rates (on bank debt, at any rate) should be expected to exhibit a positive relationship.

Let's make an attempt to summarize. If the level of interest rates, the state of the credit cycle, the dummy variable acting as a proxy for "boom" or "recession", or any of the macro variables included in these credit studies proved likely to "announce" or even "trigger" widespread defaults, then we might consider these macro risks as a potential source of systemic risk. Perhaps less ambitious, consider the heretofore-generally-accepted negative relationship between probabilities of default and recovery rates. If the deterioration of the economy serves as the single driving factor (raising default probabilities and reducing recovery rates), then this could potentially, on an economy-wide basis, trigger credit derivatives and simultaneously generate systemic risk in the banking and financial sectors. The lack of unambiguous significance in the literature of aggregate macro phenomena on credit (and credit events in particular), viewed in conjunction with standard firm-specific characteristics, tends to mitigate our immediate and urgent concern with macroeconomic risks per se as a source of systemic risk via the conduit of the credit derivatives markets, though the likelihood of a macro event as a catalyst for triggering credit derivatives certainly remains a possibility.

One final aspect of the "macro" relationship to credit involves what Lucas and others have referred to as "policy rules" (and the associated critique of attempting to estimate relationships econometrically when the behaviors of market participants change with changes in policy regime).

While this consideration may serve to challenge the weak statistical significance in the empirical studies of macro variables and credit events, what it really introduces is the notion that Fed and governmental policies (in particular, monetary and credit policies) themselves respond to the myriad of economic data and financial considerations discussed at each F.O.M.C. While that may be obvious enough, it raises the issue of whether policy action itself may trigger a series of credit events. After all, if it weren't for the unexpected tightening of interest rates in 1994, the first interest rate hike since 1989, there never would have been a Proctor and Gamble derivative fiasco or an Orange County bankruptcy.

Before leaving this section, I would like to quote Ed Altman's conjecture that we may be navigating in a new and heretofore unexplored world of credit. One fact that he pointed out is that the U.S. high yield market had less then $10 billion notional outstanding in 1978, whereas currently there is over $1 trillion outstanding – exceptional growth by any standard. Furthermore,

> "the (junk) market is not dominated by fallen angels, despite GM and Ford's inclusion in 2005, but by newly issued non-investment grade securities. … In addition, the U.S. has seen a substantial rise in the size of the syndicated loan market. Syndicated lending has risen more than 60% in the last three years and rose to total outstandings of $1.5 trillion in 2005. The growth in this sector has been paced by more risky leveraged loans. Leveraged loans … are now estimated to be about $500 billion, or about one-third of the syndicated loan market in the U.S. These higher risk and return loans are increasingly being financed by non-bank institutions, such as CLO (collateralized loan obligation) hedge funds. While large banks typically arrange these highly leveraged syndicated loans, in recent years more than three-quarters of the funds have been provided by non-bank institutions. … As is readily apparent from examining the history of high-yield bonds, however, markets are dynamic and constantly shifting. And there are times when even the most carefully constructed and tested forecasting models can be off the mark. The last few years has been one such period. Given the unique environment in the credit markets during the last several years, which has been fueled by massive liquidity and the advent of new participants like hedge funds, it is worth asking whether historically based estimates of default probabilities and recovery rates are still relevant"[20]

More on hedge funds and who's taking on this mushrooming credit risk in the next section.

Concern with Credit Derivatives from Market Professionals

There has been articulated, from many quarters, concern about the rapidly expanding market in credit derivatives. With somewhere around USD 35 trillion notional outstanding and annual growth rates that have ranged between 40% and 160%, credit derivatives easily qualify as one of the most quickly developing product areas within the capital markets. The explosive growth in credit derivatives in recent years (in terms of face amount outstanding, trading volume, and the sheer variety of products available) has raised questions about many facets of this phenomenon. Like any "new market," credit derivatives have experienced some growing pains (and we will mention a few of the problems that have arisen), but most of the anxiety that has been voiced centers on three aspects of this market:

(1) the sheer size of the notional outstanding (and, more importantly, the fact that the face amounts being traded in many names – independent of the added volume via credit indices – are integer-multiples of the current notionals outstanding in that name's debt: bonds and loans);

(2) the increasing involvement of the hedge fund community in this market;

and

(3) the operational backlogs and issues surrounding confirmations, clearing, and settlement.

Credit Derivative Notional versus Underlying Outstanding Debt

Currently, in the autos, primarily G.M. and Ford, there's estimated to be somewhere between 14 to 18 times the notional outstanding in credit default swaps (alone) than exists in the underlying bonds, notes, and loans. But, then again, that's just the autos, right? What about "in general"? Gillian Tett, Capital Markets Editor at the Financial Times, tells us that, "the total size of the CDS (credit default swap) universe is now believed to be 10 times bigger than the total pool of underlying cash bonds."[21]

What would happen if “something went wrong”? What do we even mean by “wrong”? For some in this market, a credit event could be interpreted as “something gone right”. Nevertheless, concern about the size of this market should not be underestimated.

Gerry Curtis, a distinguished investment advisor based in Boston, in one of his recent newsletters, noted the following:

> “Possibly a bigger source of risk (than the issuance of low quality debt securities) is the sale of credit default swaps to buyers who do not own the bonds that are insured. There are many bond issues outstanding in which the amount of credit default swaps is substantially greater than the amount of bonds outstanding. If the issuer defaults on the bonds, the loss to the seller of the credit default swap is many times greater than the premium received by the seller. The favorable default rate on junk bonds in 2005 and 2006 has enhanced the willingness of buyers to purchase “junk” bonds and/or sell credit default swaps.”[22]

This sentiment has been echoed by numerous other traditional institutional asset managers who are wary of what credit derivatives might “do” to their portfolios and markets. Part of the concern seems to stem from a general belief that credit default swaps, which originally played a useful role in hedging default risk associated with debt issuance, have been “carried to excess” and are now vehicles for “speculation”, and “counterproductive”.

There is absolutely no scarcity of negative sentiment regarding credit derivatives (e.g., “Somebody Turn On the Lights”, “Credit Derivatives Trigger Near System Meltdown”, and “(Credit) Derivatives Will Collapse the World’s Financial System.”).[23] By some measures, Lyndon LaRouche’s admonition that, “(t)he amount of indebtedness outstanding is greater than could ever be repaid, so the system is hopelessly bankrupt” appears discerning and contemplative by comparison (and is only slightly less disturbing than Paul Gallagher of Global Research identifying LaRouche as a “leading economist”).[24] On the topic of this rhetoric, we agree with Frank Partnoy and David Skeel who write, “Unfortunately, opinion on the credit derivatives

issue is polarized between alarmists who oppose financial innovation and supporters who naïvely embrace it."[25] Let's examine what has and could go wrong as a result of the volume mismatch.

Historically, the credit default swap market has been primarily a physically settled market. By that, we mean that upon "exercise" (following the declaration of a "credit event"), the buyer of credit protection would deliver "acceptable" debt (as in "a previously agreed upon range of bonds and/or loans") or "deliverables" in exchange for the face value of that debt (with little in the way of variations from par). For securities that are already "distressed", the typical quote would involve "points up front" in addition to the periodic credit default swap premium (where that premium is quoted in terms of basis points per annum for any fixed horizon – five years being the most common, as well as the "de facto" default tenor – and typically paid quarterly).

The point is that, if there are multiples of the underlying debt being traded in the credit default swap market, then it would seem obvious that physical settlement could be problematic. There's at least the potential for a bottle-neck. When Argentina defaulted in January 2002, the major broker-dealers got together to "net" all the trades before the securities ultimately traded hands; as in the past, there was an orderly capital markets settlement following this credit event (as opposed to the protracted cross-border legal proceedings which have accompanied sovereign defaults); in short, "it worked out". For the most part, the primary credit derivative dealers are the large global investment banks; in most of the recent industry polls (BBA, ISDA, Fitch, Risk), banks account for around 55% of credit derivative buying and 40% of credit derivative selling. This isn't surprising as they often act as the marketmakers and intermediate counterparties in this product area. That said, in the case of Argentina, it took an unusual proactive measure on the part of the banks and dealers to ensure a smooth settlement; without this coordinated action, there could have been a problem.

Why not move to cash settlement? Wouldn't that eliminate the possible "squeeze" scenario? There have actually been instances in which, upon the occurrence of credit events, the outstanding debt has traded up (as it needed to be acquired to be subsequently delivered). For example, when Delphi entered bankruptcy, it's debt, which had been trading around 57 cents on the dollar, traded up – peaking at 71 cents before ultimately falling back to around 60 cents.

Many of the academic texts suggest that cash settlement of credit derivatives has not only been possible, but common. These books are wrong (or at least "more wrong" in the case of the U.S. – as opposed to Europe where cash settlement is more common). Even credit index documentation (and it is in the indices that cash settlement makes the most sense), when last I looked, indicated physical settlement on the term sheets.

The reason for the staunch resistance to cash settlement (where the payout would be based on the difference between face value and market value) hinges on the process for the determination of what market value really is. In the past, with other products, recourse to polling a number of other marketmakers and broker-dealers and then possibly averaging the quotes (mid-market or otherwise) would serve to determine the unwind cash flow. So what has been the objection to cash settlement for credit derivatives -- and it has been a large one? One Morgan, for example, may feel singularly uncomfortable if another Morgan (which may have positions in that name's debt and/or the credit derivatives themselves) is a significant contributing factor in the broker poll. Physical settlement, then, avoids valuation disagreements and the need for market polls.

This overarching concern with the notional imbalances has led to concerns along these lines:

> "With more credit derivatives being traded than bonds available, a default by GM could spark panic buying of the company's bonds, driving up prices. The contracts would be worthless if prices rose to 100 cents on the dollar because investors would have to pay the same amount for the bonds as they received in payouts. 'The current method has the potential to significantly distort the economics of the trade,' says James Batterman, an analyst at Fitch Ratings in New York. 'There are no limits on the amount of derivatives exposure vis-à-vis deliverables' "[26]

To be blunt, I have to question his use of the word "worthless" (or ask least for clarification "to whom?"); I would replace his use of the word "investors" with "speculators"; and as for the use of the expression "the economics of the trade", I think the economics speak for themselves.

Another concern after a bankruptcy or default, not unrelated to the necessity of a broker poll or some other process for the determination of market value, is the likely loss of liquidity in the securities of the affected debtor. Thin markets tend to make people uncomfortable about taking, for example, the last traded price as a market consensus, and, following credit events, even if the debt continues to trade, it is often accompanied by spotty markets. Some have argued that the downgrade of the autos (which was not a credit event in and of itself) was not such a tremendous "shock", but that the significant market impact resulted from the institutional response – as bond funds, whose prospectuses require they hold investment grade paper, scrambled to dump Ford and GM and sought other investment opportunities.

The credit derivative market has responded to the credit-derivative-notional-versus-underlying-debt-mismatch and the issues related to polling by developing a process which seems to meet the needs of market participants: an auction. Going forward, with credit events, the broker-dealers (supported by Creditex and Mark-It Partners and in line with ISDA protocol) will participate in an actual auction (not just a polling) through which the investment banks will provide inside markets, market orders, limit orders, automated electronic trades, and arrive at a final settlement price. If one Morgan thought the other Morgan was too low on his valuation for the defaulted debt, the first Morgan could express his belief by buying it in that market (voting with his dollars as it were) – independent of credit derivative positions. This process has already been successfully implemented for Calpine, Collins & Aikman, Dana, Delphi, Delta, Dura, and Northwest Airlines over the last couple of years, has been supported and embraced by the dealer community

(contributing members include ABN Amro, Bank of America, Barclays, Bear Stearns, BNP Paribas, Citigroup, Commerzbank, Credit Suisse, Deutsche Bank, Dresdner, Goldman Sachs, HSBC, JP Morgan, Lehman, Merrill Lynch, Morgan Stanley, Royal Bank of Scotland, Societe Generale, and UBS), and has recently (February 2007) been extended to electronic tradable tranche fixings for credit indices.[27]

This auction process now allows for the cash settlement of credit default swaps following a credit event (making the "derivative/underlying debt" imbalance something of a non-issue as well as making the invariably uncomfortable polling unnecessary), and should help allay fears about the sheer number and notional magnitude of these derivatives being traded.

There remains a great deal of unfamiliarity on the part of many market professionals with respect to the specifics of these contracts:

> "However, for a CDS (credit default swap) contract to be valid, it needs to be backed up by some tangible bonds in the marketplace (even if far smaller in size). Usually that is not a problem, since few companies are debt free. But if corporate events occur which prompt a company to withdraw its bonds – such as a merger – this can suddenly make CDS contracts worthless. … For the CDS market is now so monstrously large that the behaviour of the derivatives is exerting an increasingly large impact on the cash market. The tail, as they say, is wagging the dog"[28]

There are actually well defined protocols for such corporate activities as mergers, acquisitions, spin-offs, and other corporate actions called succession events (which we will not get into here).

Perhaps one last thought on underlying mismatches before leaving this topic (as it is one of the main sources of concern regarding credit derivatives). There are a number of (very successful and important) derivative contracts which "cover" underlyings which themselves are relatively small, illiquid, not traded, or even nonexistent as a stand-alone asset. Dozens of instances come to mind. The Treasury Bond futures contracts are on a notional 6.00% (semi-annual) coupon 20-year U.S. Treasury bond; there is no such thing (and even if, by chance, there were today,

there wouldn't be tomorrow). What's made this contract particularly interesting is (1) the fact that it has been, and continues to be, physically settled (giving rise to lists of "eligible-for-delivery" securities, conversion factors, cheapest-to-deliver instruments, embedded options,…) and (2) the fact that the U. S. Treasury stopped issuing bonds for a time. While the futures contracts never stopped trading (though there always did remain deliverables) and while a large portion of the volume of trade has shifted to the 10-year Treasury Note futures contract, there is no reason why bond futures, in principle and in practice, couldn't trade even if there were no deliverables. CMTs (Constant Maturity Treasuries) also qualify by this criteria. EuroDollar futures, the most actively traded futures contract in the world, are cash-settled 3-month LIBOR futures (and they have their own quirks), but they are nominally on 90-day deposits (which the Chicago Mercantile Exchange will never make or take). The S&P 500 derivatives complex (futures and options on the futures at the Merc and options on the CBOE) "pay off" based on where the underlying stocks close; we once claimed that there was no S&P 500 cash product, but exchange-traded funds (SPDRs or ticker "SPY") has mitigated that assertion. VIX derivatives traded on the Chicago Board Options Exchange are contracts which have payoffs based on the implied volatility as determined by several option quotes. OTC variance swaps also have payoffs based on actual volatility (in this case, usually non-detrended historical variance of returns). There is no variance (per se as an asset) that trades, but no one worries about the settlement of these contracts. Non-deliverable forwards (NDFs) on Chinese Yuan or Renminbi have paid off without involving the underlying currency, and the FX market, the largest market of them all, generally trades on an order of magnitude 40 times larger than the volume associated with the entire global value of international trade; if "excessive volume" or "speculation" were reasons to terminate trading in a product, FX would be the first to go.

Of course, with every derivative (be it a future, forward, swap, or option), for every seller, there's a buyer and for every buyer, there's a seller. While I am decidedly not of the opinion that derivatives are zero-sum instruments, I understand the statement that, "Risk is neither created nor destroyed, just repackaged and redistributed." Given the propagation of derivatives in general and the growth of credit derivatives in particular (and recognizing that many of these OTC trades are leveraged), there are those who think their existence adds risk to the market place. Risk is a two-edged sword. Whether one gets long a credit name by buying their corporate bonds or selling credit protection via a credit default swap, the major difference is funding (and therefore leverage). If this sounds odd, consider that, far and away, the most common equity derivative strategy is selling puts – synthetically; this overlay strategy, which involves buying (or owning) the underlying stock and writing (or selling) calls against that long stock position is most often referred to as a buy-write or covered-call or covered write (or over-write). Many consider this strategy to be a low risk investment play. Many would consider "naked" put selling, though, to be extremely risky. The primary difference between these two strategies is funding. So, why would someone prefer one strategy over the other? Good question.

Oh yeah, by the way, in 2003, the size of the OTC credit derivative market topped the size of the entire OTC equity derivative market[29], and this ratio now stands at around 5.

Hedge Funds and Credit Derivatives

Although hedge funds have been involved in some of the larger derivative disasters (I once heard someone on a trading floor say, "Long Term Capital Management … " to which someone else interjected, "They were neither. They didn't last long and apparently didn't manage their capital very well either."), many hedge funds understand the risks of derivatives (and credit derivatives in particular) well, use them responsibly and effectively, and provide support and depth to a market dealing in risks that were once concentrated in the banking industry.

Independent of the on-going trend which continues to see flows into hedge funds, they command under 3% of global investable wealth (around USD 1.25 trillion). Although any statement which starts with the words, "Every hedge fund …" is likely false (given the range of strategies employed by the myriad hedge funds out there today), most do indeed "hedge". The most common hedge fund strategies continue to be "equity long-short". This might involve, for example, going long General Motors stock and short Ford stock. While there are many ways to get "market neutral," the main idea is that if the market goes up or down, you're o.k. as you're simultaneously long and short; if the auto sector goes up or down, you're covered (because you're long and short). It bases its returns on the specific over-performance/under-performance in the chosen pair of securities. Variants of this strategy typically do not involve very high leverage (either using borrowing to "magnify" ones positions or using derivatives to command greater positions than the cash market would provide). Typically, there is greater leverage employed in risk arbitrage (i.e., merger or take-over strategies) and in convertible bond arbitrage (buying convertible corporate debt, hedging the equity risk by shorting the corporation's stock, and turning the exposure into a volatility trade). The one strategy which usually does involve larger degrees of leverage is fixed income arbitrage; LTCM (which was, after all, primarily a

fixed income hedge fund) told their investors that they intended to lever their positions 20 to 25 times (i.e., for every $1 they received, they were going to take on $20 to $25 of risk). That said, it's been argued that one of the most problematic aspects of the LTCM debacle is the ease with which they were able to lever their positions and access financial resources from the major banks. In that regard, I think the banks have learned their lesson. Nevertheless, it's been argued by Alex Ineichen, a world-class authority on hedge funds, that, "many of LTCM's strategies would have worked if they could have held onto their assets for some months longer."[30]

Many hedge funds use credit derivatives to lay off risk. Consider one of those convertible arbitrage funds (buying convertible bonds and selling stock). If they want to strip out the credit risk of these bonds (which they own), they could pay so many basis points per annum to know that, worst case, they have the right to sell this debt for its face value. On the other hand, some hedge funds are engaged in more sophisticated strategies (for example, buying 5-year credit protection on Ford and selling 5-year credit protection on General Motors – with no intention of holding this trade for 5 years). Unlike buying straight corporate debt on the one hand and attempting to short another corporate bond (which would tie up financial capital), doing two credit default swaps may give the hedge fund exactly the exposure they would like (with only a net capital charge or net margining on the part of their counterparty/counterparties). Edward Chilcote reports that, "(h)edge funds lost hundreds of millions of dollars, owing to their exposure to derivative contracts and the downgrading of General Motors' and Ford's debt in May".[31] One need only hear this assertion to raise the obvious question, if the hedge funds lost, then who won?

Chilcote goes on to characterize "hedge funds … that specialize in credit-default swaps" as "secretive". Louis Moore Bacon is one of the grand old men of the hedge fund industry (and credited with an extremely impressive track record at Moore Capital). Bacon, at a Hedge Fund Symposium in London in 2000, identified what he called the 5 warning signs for hedge funds[32]:

(1) size (getting too big and exhausting the available investment opportunities within ones area of expertise – and beyond some point morphing from being one of the hunter-gatherers to "becoming the game"), (2) leverage (taking on too much risk), (3) transparency (in tremendously understated fashion, Alex Ineichen tells us, "Full transparency of current positions is commercially unwise."), (4) funding (asset and liability mismatches), and (5) hubris (what Roger Lowenstein has identified as potentially the most dangerous Greek of all[33]). Perhaps the greatest detriment to hedge funds today is their association with LTCM (where all five of the above factors came into play in a significant and negative way). At any rate, many hedge funds are understandably reluctant to disclose their positions. Not only is this their stock in trade (i.e., their security selection process, hedging techniques, valuation models, portfolio construction methods,…), but hedge funds know that a market participant with "deeper pockets" could trade against them.

This scenario is not just the creation of the paranoia of a few hedge fund managers; it is probably far more likely to occur than one would think. Take the case of Amaranth Advisors L.L.C. (a large hedge fund that was based in Greenwich, Connecticut). They apparently got into trouble in the fall of 2006 with losing positions in energy derivatives (the "D" word again), though they did utilize what they referred to as a "multi-strategy" approach and traded convertible bonds as well as other instruments. Amaranth's typical leverage ranged between 6 and 8.

The following was reported in the Wall Street Journal (after their 6 billion dollar loss):

> "Hedge funds are among Wall Street's biggest customers, and the Street gives them red carpet treatment as the fees roll in. But the Amaranth case shows how Wall Street dealt with a fund after it had traded its way into a deep hole. Information the fund revealed about its holdings as it grasped for a lifeline let other commodity-market players, Wall Street firms included, exploit its positions. As they drove prices relentlessly against Amaranth, its losses swelled, and instead of facing a big but possibly survivable setback, it collapsed."[34]

There were disturbingly similar allegations in the case of L.T.C.M.

If someone were to claim that hedge funds constitute a major source of systemic risk, the natural place to start looking for it would be with the investment banks. None of the investment banks or securities houses, to my knowledge, has complained about the fact that around half of all trades on the New York Stock Exchange are done by hedge funds; furthermore, don't hold your breath – many of the larger investment banks are generating 15%, 20%, 25% or more of their revenues from hedge funds. This is not surprising as many hedge funds trade very actively and opportunistically. In principle, the investment banks, as prime brokers, clearing agents, flow trading counterparties,… should be in an excellent position to properly assess a hedge fund's credit risk and charge/margin for market exigencies, but there is at least the potential for a perceived conflict of interest.

Blaming hedge funds in general for market disasters is like blaming well-fed vultures for dead animals – while often seen together, it doesn't mean that one is the cause of the other. Contrary to what seems to be the norm, Alan Greenspan has praised the ability of hedge funds … to make the financial markets more efficient, to bring some contrarian balance in times of overly-enthusiastic exuberance, and to provide needed liquidity to markets – especially in turbulent market scenarios.[35]

In situations in which hedge funds have gotten into trouble, we should ultimately look for the real source of the problem (which may have been nothing more sinister than a bad investment or a strategy gone awry). Although it was felt at the time that LTCM required a Fed-orchestrated bail-out for the good of the financial system as a whole, there have been subsequent hedge funds which have "gone away" with little in the way of concern that the banking system or financial markets (national or global) might be "at risk" or "in peril". Furthermore, LTCM was atypical (particularly at the time) in its size; it was far and away

the largest hedge fund at that time (based on assets under management). It's seldom pointed out that LTCM returned financial capital to investors as investment/trading opportunities in the market waned). With regard to the exceptional events surrounding LTCM), I'd like to quote one authority:

> "The primary mechanism for regulating excessive leverage and other aspects of risk-taking in a market economy is the discipline provided by creditors, counterparties, and investors. In the LTCM episode, unfortunately, market discipline broke down. LTCM received generous terms from the banks and broker-dealers that provided credit and served as counterparties, even though LTCM took exceptional risks. Investors, perhaps awed by the reputations of LTCM's principals, did not ask sufficiently tough questions about the risks that were being taken to generate the high returns. Together with the admittedly extraordinary market conditions of August 1998, these risk-management lapses were an important source of the LTCM crisis."[36]

(Parenthetically, one can only wonder whether LTCM would be around today if they had utilized credit derivatives as part of their arbitrage strategy.)

The demise of Amaranth is an excellent counterpoint. There was no furor in the financial press (at least, not until the role of the investment banks started to become better understood); there was no talk of a government-sponsored bail-out; and the possibility of collateral damage or systemic risk never even seemed to have been mentioned. Moreover, no one blamed derivatives for this implosion. Amaranth was a hedge fund (but at least part of their portfolio was assumed by another large hedge fund). There were certainly losses, but no former employees appeared on television lamenting the loss of their retirement savings. Maybe we're getting it right. Or, at any rate, bashing hedge funds just because they are hedge funds seems to be losing popularity.

Having worked at UBS, I believe I have some insight into the investment banks' point of view. Alarm bells would surely be tolling if a bank knew that every hedge fund had on exactly the same trade(s); this sort of concentration of risk (gone wrong) may have repercussions for their banking counterparties – even if the "klumpenrisk" (the individual net exposure to the

broker-dealer to a particular entity) is nominally managed to be "small". In essence, if every hedge fund were doing the same thing, although booked as separate institutional relationships, it would be nothing more than a multiple-location LTCM scenario. The job of credit risk control for hedge funds has to be one of the more challenging roles at an investment bank today.

This systemic danger (of hedge funds taking on similar positions) has not gone unnoticed. The European Central Bank (ECB) has warned,

> "(T)he increasingly similar positioning of individual hedge funds within broad hedge fund investment strategies is another major risk for financial stability which warrants close monitoring despite the essential lack of any possible remedies. This risk is further magnified by evidence that broad hedge fund investment strategies have also become increasingly correlated, thereby further increasing the potential adverse effects of disorderly exits from crowded trades."[37]

The influx of financial capital into hedge funds, in conjuction with the concentration of trading strategies in this universe, probably explain the recent less-than-stellar industry performance.

To say that hedge funds have been under tremendous, continual, on-going scrutiny would be an understatement. The question is whether (and how) regulatory intermediation would help. Alan Greenspan spoke at an IMF Conference in Beijing in June 2005 on hedge funds; Risk magazine reported as follows:

> "…Greenspan said (beyond his belief that some market participants were taking on "risks for which their compensation is inadequate," that the hedge fund industry had expanded too quickly and should temporarily shrink, and that CDO returns were destined to be disappointing in the near term) he was not particularly concerned that this may have a negative impact on financial stability, as long as banks and other lenders are managing their credit risks effectively"[38]

In other words, for those who qualify as eligible investors in hedge funds, laissez faire, and, as for the investment banks who are the ultimate risk watchdogs, watch your credit risk! As Juvenal asks, though, "Quis custodiet ipsos custodes?" (Who will guard the guardians?)

One last point about hedge funds and credit derivatives. Philippe Jorion, a recognized authority on risk management (both market risk and credit risk), reports an interesting (and

possibly surprising) fact about the use of credit derivatives by hedge finds (based on a 2003 B.B.A. survey), "Hedge funds and securities firms … are fairly balanced, each with about 16% of protection buyers and sellers."[39]

Kind of makes you wonder where the credit risk is going, then, doesn't it?

Operational Risks

When I first entered the financial world, it was with a proprietary option trading firm based in Chicago known as O'Connor and Associates. At the time, much of their trading took place on exchange floors (in Chicago and around the world). O'Connor was recognized as being among the best at what they did (and what they claimed to understand, better than anyone else, was risk management). For an O'Connor trader, there was one ultimate cardinal sin – "not knowing your position". It is this unpardonable offense, for the world of credit derivatives generally, that has led to well-warranted criticism and ill-informed hysteria.

Alan Greenspan, over the years, has been among the staunchest defenders of derivatives claiming that they re-allocate risk into the hands of those who are best capable to take on, warehouse, and dynamically manage those risks. In 1999, Greenspan said,

> "By far the most significant event in finance during the past decade has been the extraordinary development and expansion of financial derivatives. … These instruments enhance the ability to differentiate risk and allocate it to those investors most able and willing to take it … a process that has undoubtedly improved national productivity growth and standards of living."[40]

There are also those at the other end of the spectrum. Indeed, there have been some interesting articles comparing and contrasting the thoughts and beliefs of Alan Greenspan and Warren Buffett on this topic – as both having been outspoken on the uses and value of these instruments.[41] For those who have not been following, Buffet has labeled derivatives "financial weapons of mass destruction". It's been said that much of what Buffett's claimed is disingenuous as he's used derivatives himself, but he makes an important point we'll revisit later.

It is interesting, then, to hear of not only a criticism of derivatives from Greenspan, but to hear of a Federal Reserve intervention (back in September 15, 2005) ordering a group of credit derivatives dealers "to get their act together" on the heels of a revelation that there

were significant unprocessed credit derivative trades outstanding. The cardinal sin. How can you manage risk if you don’t know what the risks are? And how can you know what the risks are if you don’t know what your positions are?

Timothy Geithner, President of the Federal Reserve Bank of New York, at an N.Y.U. Credit Risk Conference in New York City last year touched on (and reiterated) this potential problem:

> “These concerns … suggest the need for greater caution by financial institutions in several important areas. … (I)t is very important that the major dealers make the investments necessary to improve the operational infrastructure that underpins the credit derivatives and broader OTC derivatives markets. Operational risk and infrastructure failures have played a prominent role in past financial crises, and the infrastructure weaknesses that have characterized the credit derivatives markets since their inception are an ongoing source of concern.”[42]

Since the September 15th castigations (which reflected concerns originally articulated in June 1999 on the heels of the LTCM disaster in a document known as “Improving Counterparty Risk Management Practice” put out by the Counterparty Risk Management Policy Group under the direction of Mr. Corrigan and Mr. Thieke and then updated and re-issued, again under Mr. Corrigan, in July 2005 with the title “Toward Greater Financial Stability – A Private Sector Perspective” – addressing current topics of concern), the industry has worked diligently to reduce those trade backlogs and expedite the processing, confirmation, and settlement of credit derivatives. Originally, the 14 banks agreed, among other things, to cut the number of unsigned trades by 70% before July 2006. Not only was that goal exceeded (“Credit derivative dealers have reduced a backlog in processing trades by more than 80%, more than their target, an industry trade association said” on July 26, 2006)[43], but, in 2005, the larger credit derivative traders reduced the average confirmation lag from 23 days to 16 days.

The FSA (the U.K. financial regulatory authority) in their Financial Risk Outlook 2006 wrote

> "Credit derivatives provide a valuable mechanism through which financial market participants can manage their credit risk, bringing together those who wish to reduce credit exposures with those who are prepared to increase them. The market has continued to grow at a rapid pace and firms such as hedge funds have become increasingly important, as both buyers and sellers of these instruments. Operational and legal risks may arise if the market is unable to keep up with this growth.
>
> Without confirmation that a trade has taken place, parties to the transaction are exposed to legal and financial uncertainty. If a credit event occurs while a credit-derivative transaction remains unconfirmed, doubt as to its legal validity and contractual responsibilities could prevent the transaction from being executed. This uncertainty could create liquidity problems and act as an accelerant in a financial crisis."[44]

Similarly, in "Growth in Credit Derivatives Putting Stress on Controls, Despite Progress in Clearing Trade Backlog" in the November 2006 issue of Global Finance, Gordon Platt tells us, "The rapid growth in global credit derivatives is putting stress on settlement systems and operational controls, despite significant progress in clearing a big backlog of unconfirmed trades". Although improvements are reassuring, this points to the possibility of a catalyst for a system-wide breakdown. It is neither the instruments themselves nor the fact that hedge funds are increasingly involved in credit derivatives which constitute the greatest concern. Operational risk is certainly a well-founded consideration on its own.

There have been some initiatives proposed which could act to mitigate some of the operational risks. For one thing, the European exchange Eurex started trading futures on the iTraxx index at the end of March (2007). These behave like the credit default swaps which trade OTC, but with the exchange counterparty support (reducing counterparty risk), with much more transparent pricing, and with the associated daily mark-to-market margining. The Chicago Mercantile Exchange has also reported its intention to list credit event futures contracts (originally targeted for Q1 2007, now with a May 2007 start date) and, as usual, the Chicago

Board Options Exchange is close behind. As is not uncommon, given the rivalry between the OTC market and the exchanges, the banks initially declined to participate in trading these exchange-listed contracts – one head of credit trading in London calling the contracts “flawed”.

So,…What are the Risks?

Early Problems

Mention was made of “glitches” in the development of credit derivative products and markets. There are some “classic” errors that were made early on in this market’s history (many of which have achieved almost folklore status). In one instance, namely “Anderson”, credit protection was sold and bought on a company which turned out to be a parent/holding corporation that did not have any outstanding debt. In essence, there were no deliverables. This sort of “slip” has been addressed, among other safeguards, by the creation of the REDs (Reference Entity Database Service) which is intended to eliminate any ambiguity regarding the longer legal names of counterparties (that may have similarly labeled affiliates or possibly unrelated but close-sounding names) and which links a particular name to a specific debt issue. For the purposes of, say, a credit default swap, this ensures that the credit being traded is properly identified. For the record, what one is buying/selling protection on – in terms of the institution and the level of debt (e.g., senior unsecured) referenced – may differ from the “deliverables” in the case of a credit event. Obviously an issue, but hardly a source of systemic risk.

A facet of this market which is often not discussed is the bilateral nature of a credit default swap. Reference has been made to these contracts as options – specifically put options on debt. A credit default swap (CDS), though, is a swap (not an option) and can be “triggered” by either the buyer of protection (which is what most of us think of) or the seller of protection. One might ask why would a protection seller trigger a CDS when that would result in his/her receiving defaulted debt which is trading, say, 70 cents on the dollar. The answer is that there are a number of reasons why a protection seller may wish to do this. Perhaps the most important (particularly in the early days before the standardization of the documentation or “standard docs”) involved

the need for a marketmaker who had, say, sold protection for 45 basis points and then purchased it, from another counterparty, for 42 basis points (if this trade is not assigned), to ensure that there was not a substantive difference between the debt that was being received and the debt that was required for delivery (which, at some point, involves a notice of physical settlement – a "letter" indicating the specifics of the debt that is going to be proffered). If the market was to continue with physical settlement, this could pose a systematic concern, but, in light of the new auction process (and accompanying cash settlement), is not a cause for a systemic breakdown.

Conseco

Because of its landmark nature, let me very briefly review the Conseco case. In September 2000, Conseco (an insurer, lender, and financial services company based in Indiana) found itself in financial difficulty. They had acquired a home lender known as Green Tree Financial which made mobile home loans; unlike most home equity loans, where the value of the home tends to rise, this often is not the case with mobile homes. Conseco, therefore, experienced an urgent need for financing, and, through its bankers (Bank of America and Chase Manhattan) were able to renegotiate its debt. Officially, this constituted a credit event (under the category of "restructuring"). It was alleged that at least one of the banks, having bought credit protection on Conseco, subsequently triggered credit default swaps. Moreover, since there was not a bankruptcy (in which the majority of debt might have traded *pari passu*), because Conseco was still a viable business, there remained a credit term structure. Longer-dated Conseco debt was trading 68 cents on the dollar (whereas the extended 15-month loan was trading 92 cents on the dollar). Those who had bought protection and chose to "exercise" obviously delivered the longer-dated debt. The subsequent clarification of exactly what constitutes restructuring, who

may “call” the credit event, what may be delivered (leading to the definition of modified restructuring or “Mod R” – which requires the deliverable to be “like” the protection traded), all reflect some of the growing pains associated with the credit derivative industry.

Credit Risk Models

It has long been known that credit risk is not an easy nut to crack (read, “concept to model”). Anyone who had ever traded options, for example, knows that the Black-Scholes formula does not precisely fit the real world, but, for European-style options on non-dividend paying stocks, it works fairly well. There are a great many quotes along the following lines: “Models are to be used, but not to be believed.”, “All models are wrong.”, and “I’ll take a good trader over a great model any day.” Nevertheless, models have their uses. Why is modelling credit risk so difficult?

As far back as 1999 (the year of the publication of the first comprehensive, standardized ISDA credit derivative documentation), Ken Phelan and Colin Alexander concisely summarized what they perceived to be the primary impediments to developing a framework for evaluating credit risk:

> “Credit risk is more difficult to model than market risk for several reasons. First, the lack of a liquid market makes it difficult – or impossible – to price credit risk for a specific obligor and tenor. Second, true default probabilities in the market cannot be observed. Users must determine these probabilities by either inferring default rates based on observed historical experience of the public credit ratings, using a model such as KMV’s Credit Monitor, or determining the default rate through a subjective credit approval process. Third, default correlations are quite difficult to observe or measure, making it hard to aggregate credit risk. And fourth, to calculate the equity/capital cushion, it is necessary to estimate the tail risk probabilities of asymmetric, fat tailed loss distributions.”[45]

There are some substantive difficulties listed here.

Philippe Jorion tells us in his Financial Risk Managers Handbook, “Risk management starts with the pricing of assets.”[46] Theoretical valuation is the key to understanding and managing risk.

It is no surprise that when one looks at aggregate market data on credit derivatives broken down by market participant (whether from BBA, Risk, ISDA, Fitch), it appears that banks/dealers account for about half of the buying and half of the selling. In short, the marketmakers are probably acting as marketmakers. At UBS, they drew a distinction between what they called their "flow business" and their "structured business" – the former being primarily a marketmaking operation or market conduit and the latter generating trades that would likely not be backed-to-back (even if they were ultimately hedged using more standardized credit products). If a marketmaker is running a matched book, the removal of one link in the settlement chain should not be particularly problematic (and certainly shouldn't bring down a systemic cataclysm). For that reason, as long as the dealers properly manage their credit risk (in the sense of counterparty collateralization and risk capital), one would think a credit event – even on a "big" name like G.M. – wouldn't start a meltdown. One hedge fund trader once lamented that one of the large banks kept asking him to share his positions (which he was adamant he would not); the trader indicated that he was more than willing to incur capital charges and margining based on his direct exposures to that bank, but that he would not disclose his portfolio to that institution; as mentioned earlier, this sort of reluctance on the part of most hedge funds to share their positions is understandable. In one of the less cogent articles suggesting that credit derivatives might result in the systemic breakdown of the financial markets, Edward Chilcote noted that "Long Term Capital management did not disclose its risk or positions to investors or counterparties."[47] This runs counter to the criticisms of former LTCM principals who claim, in their search to find a source of financial support to allow them to weather the Russian debt crisis, that they were taken advantage of by the larger banks once their positions had become known.

Back to valuation, why is credit risk so difficult? When we consider "credit events", we are

talking about low-likelihood, tail probabilities (which are often recognized as particularly unstable). Jessica James told us, "there is no robust way of finding the fair value of a credit derivative."[48] Frank Partnoy and David Skeel go one step further; with regard to credit derivatives, they write, "The mathematical precision of the models is illusory" and "If the mathematical models have serious limitations, how could they support a multi-trillion dollar industry?"[49] One of the most difficult modeling issues involves the portfolio risk management of credit risk. At issue is the determination of the correlation between defaults, a consideration particularly important in tranched (such as synthetic collateralized debt obligations and first-to-default structured products). One hears credit risk modelers talk about such things as fat tails, copulas (elliptical, Archimedean, extreme value, Clayton's, Frank's, Gumbel's,…), and conditional correlation coefficients. The interested reader is directed to Extreme Financial Risks by Yannick Malevergne and Didier Sornette (2006).

The Autos: What Went Wrong?

The automobile manufacturer downgrade in 2005 "surprised" some people. They lost money and, at first, did not understand why. Let's look at this event in a little bit of detail.

On May 5th, 2005, Standard and Poors, the credit rating agency, downgraded Ford one "notch" to BB+ and G.M. two "notches" to BB (these moves signifying a change in their debt ratings from investment grade to sub-investment grade or "junk"). Although S&P had given anticipatory "hints" that these downgrades were possibly to be expected, the market response was immediate and chaotic.

By this date, there were many hedge funds engaged in "capital structure arbitrage" on the autos. This often involved trading debt versus equity or one level of debt (e.g., senior unsecured) versus another level of debt (e.g., junior subordinated). One trade that many hedge funds had on

was a long bond and short stock position; the idea was that if the autos did poorly, the ability to recoup something on the debt was relatively high (there was "expected" to be some recovery value on the bonds) whereas if the company went under, the equity would likely be worthless. Many hedge funds, instead of buying the bonds, effectively got long the auto credit risk (synthetically) by selling protection through credit default swaps and then short sold the stock. What could go wrong?

After the downgrade, the price of protection sky-rocketed. On their credit trade, they had a "mark-to-market" loss. One would think the equity (being subordinate to the debt in case of distress or impending bankruptcy) would lead the bonds, and this is a reasonable presumption, but, at that time, in a very public way, an opportunistic corporate raider named Kirk Kerkorian suggested that he might want to acquire a large block (28 million shares) of G.M. stock at $31 per share (a 13% premium over the previous closing price). G.M. equity took off (causing those who were short the stock to experience a "mark-to-market" loss); for those using stock as a hedge for their credit derivatives, they lost on their "hedge" too!

There were other trades which hedge funds had on which also "blew up". We have not gotten into the details of some of the more structured index credit derivatives, but some hedge funds traded tranches of portfolios of credit risk. In selling protection on the "equity" tranche (which isn't equity at all, but debt – though, like equity, this tranche experiences the first losses) and hedging by buying protection on the mezzanine tranche (which takes the next "hit") of various structured credit derivatives, essentially these investors were entering into a correlation trade. In the case of the autos in May 2005, what we saw was a case of "correlation gone wrong". The impact on Ford and G.M. was huge, but other corporate spreads were essentially unchanged. The price of protection on the equity tranche rose from 16% to 50% (i.e., it tripled) whereas the

mezzanine tranche was unchanged. “But I thought I was hedged?”

Liquidity

One of Warren Buffett’s favorite similes goes something like this:

> Derivatives are like hell – easy to enter and almost impossible to exit.

Although this characterization may be glib, it touches a nerve. Liquidity does constitute a systemic concern. There are different definitions and, therefore, measures of liquidity, but in this context, it refers to the ability to trade continuously in markets made up of several competing dealers with reasonable two-sided bid-offer spreads offering conventional trading volumes. There is grave concern that, if a number of names simultaneously experienced credit events, the system would grind to a halt.

On this count, although one usually thinks of the large investment banks as the marketmakers, hedge funds may actually prove helpful. In “On the Hedge Fund Question: A Program of Reckless Complacency” (October 2006), Randall Dodd from Financial Policy Forum tells us, “The OTC market in credit derivatives is often cited as a case in point where hedge funds play a critical role in market liquidity. Indeed it is likely the case that market depth and bid-ask spreads are improved by the participation of hedge funds.”

Perhaps of greater concern would be the response of the broker-dealer community – either in their unilateral response to simultaneous large-scale credit events or in the treatment of their counterparties under such a scenario. Of course, two-sided trade flow is the life-blood of a marketmaker; without that flow, the best a trader can hope for is to dynamically manage their risks as they accumulate, … and this brings us back to hedging, modelling, and valuation.

Small Number of Dealers

When the New York Fed summoned the credit derivatives dealers on September 15, 2005 (to admonish them regarding their operational shortcomings in credit derivatives), only 14 institutions were present. In 2004, 81% of credit derivatives bought and 75% of credit derivatives sold were accounted for by only 15 large banks. The most recent Fitch "Global Credit Derivatives Survey" (September 21, 2006) reports that the top 10 institutions make up 66% of the volume in credit derivatives. Even that may be misleading as the majority of the volume in credit derivative trading is done by four counterparties: J.P. Morgan, Morgan Stanley, Deutschebank, and Goldman Sachs.

While this concern involves industrial organization, it bemoans the fact that a large percentage of the volume of credit derivative trading is concentrated in the hands of a relatively few dealers.

Alan Greenspan admits, "One development that gives me and others some pause is the decline in the number of major derivatives dealers and its potential implications for market liquidity and for concentration of counterparty credit risk."

There is no doubt that an unexpected "departure" of any one of these primary dealers would have very negative repercussions on the credit derivative market, but, not to be dismissive, in light of the fact that credit derivatives only account for about 7% of the OTC derivative volume and cognizant that these banks are major players in most of the OTC derivative markets, a number of market participants would probably have more to worry about than credit derivatives.

Legal Risk

At the end of the day, credit derivatives are almost exclusively unique bilateral OTC contracts and, as such, are only as good as the contractual documentation which the attorneys

draft. This explains the preponderance of lawyers on and around credit derivative desks.

In the world of derivatives, some still remember a trade (an interest rate swap contract) entered into by the local U.K. municipal authorities of Hammersmith & Fulham; when interest rates moved against the municipal government's position, they sought (and eventually obtained from the House of Lords) a formal judgement ordering the nullification of the transaction as illegal.

In the world of credit derivatives, a number of issues have ended up in court. Most recently, Bear Sterns bought protection from Aon on a Philippine corporate backed by a government agency. Aon then bought protection from Societe Generale on the Republic of the Philippines. When the Philippine agency withdrew its backing of the Philippine corporate, this constituted a credit event on the Bear Sterns-Aon CDS, but did not trigger the Aon-Soc Gen CDS. The court (2nd U.S. Circuit Court) upheld the content of the respective contracts, lending support to the process and providing additional confidence in the use of standard documentation.

An incredibly disturbing statistic was found which highlights the importance of maintaining proper legal documentation; a Fitch report indicated that in some 14% of credit derivative claims, there have been subsequent legal proceedings. "In some instances, the disputes have involved assertions that one of the parties breached fiduciary duties owed to its counterparty, the risks associated with the transaction were not adequately disclosed or the transaction as not suitable for the counterparty." Caveat vendor! (Seller beware!)

Insider Trading

There have even been allegations of "insider trading" in the credit derivatives market from both the practitioner community [The Joint Market Practices Forum (May 2003) and

“Credit Default Swaps May Incite Regulators” Bloomberg (October 10, 2006)] and the academic community [“Insider Trading in Credit Derivatives” Viral V. Avharya and Timothy C. Johnson London Business School (May 2005)]. Insider trading rules are well defined for “securities”, but OTC credit derivatives formally fall outside their purview. What this consideration really speaks to is the potential for material non-public information flow within the larger broker-dealers.

And, really, after consideration of all these risks, what is the worst that could happen? Stephen A. Ross, in “Forensic Finance: ENRON and Others”, tells us,

> “As a general rule, regulatory and legislative activity follows any period of financial tragedy, and, however well intentioned, its statutes are often structured in some haste and as much in response to the drama of the events as to the logic. Not unexpectedly, they usually take the form of prohibiting certain activities that were held up by the media as grotesque examples of abuse, and rarely do they take account of the reality that the cure might be worse than the disease. …
> What is remarkable is not the failures, but rather how exceptional they are and how well the market system seems to work overall.”

Conclusion

The mission of the Federal Reserve System falls into four categories:

- conducting the nation's monetary policy by **influencing** the monetary and **credit conditions in the economy** in pursuit of maximum employment, stable prices, and moderate long-term interest rates
- **supervising and regulating banking institutions to ensure the safety and soundness of the nation's banking and financial system** and to protect the credit rights of consumers
- **maintaining the stability of the financial system and containing systemic risk that may arise in financial markets**
- providing financial services to depository institutions, the U.S. government, and foreign official institutions, including playing a major role in operating the nation's payment system

(author's emphasis added).

There is no doubt that credit derivatives impact at least three of these duties in a significant way. The probability of systemic risk in the banking industry attributable to credit derivatives stemming from macroeconomic events is probably much lower than in the past – due to the dissemination of default risk among a broader investor base. This may not be true, though, of the insurance industry ("insurance companies account for only 1% of protection buyers versus 20% of protection sellers."). For the financial system as a whole, recognizing that hedge funds, on balance, supply/demand comparable magnitudes of credit derivatives to/from the market, these would appear to provide a buffer for traditional lending institutions. One caveat here is the potential for concentration risk if hedge funds all end up taking on the same (losing) positions.

The distribution of risk has its downside, though, in terms of control. Some may recall the days in which the Fed targeted the money supply. Because banks were so clever at creating money substitutes (regardless of the various definitions of money: M1, M2, M3b,…), eventually the Fed simply gave up attempting to control or target the monetary aggregates. One wonders whether there is an analogue at work with the control of credit risk (through credit derivatives).

The impressive growth of the marketplace for credit derivatives speaks for itself.

Recent developments in the settlement procedure, reductions in operational risks, and other advances to improve the clearing, transparency, and liquidity of the market bode well for the continued success of these products. Nevertheless, there still remain potential concerns; these include moral hazard associated with the due diligence responsibilities of those playing a role in the debt origination process, the relatively small number of large broker-dealers, potential conflicts of interest (given the role of the banks as hedge fund counterparties in conjunction with their traditional role in a lending/credit function), the ability to manage credit/counterparty risk, the challenges associated with modelling and hedging the more complex of the credit derivatives, liquidity, and, as always, legal risks.

When engaging in considerations of catastrophic or systemic risks, Donald Rumsfeld's quote (from a Department of Defense news briefing – February 12, 2002) always comes to mind:

> "As we know, there are known knowns. There are things we know we know. We also know there are known unknowns. That is to say we know there are some things we do not know. But there are also unknown unknowns, the ones we don't know we don't know."

Here is one last conjecture for a potential source of systemic credit risk. In an article entitled "A Needle to Pop the Debt and Derivatives Bubble" (dated May 5, 2003), Donald Perry wrote:

> "A hot topic of debate has been the financial shock that precipitated the stock market crash of 1929. Following that decline there was increasing unemployment, business bankruptcy, bank failure and deflation. Similar conditions are being mirrored today. … (W)e have the largest debt bubble in history at a time when there is growing business failure and unemployment. As continuing growth in debt and the derivatives market weaken the US and world financial condition, some have wondered what future shock could precipitate a massive economic collapse similar to 1929? … There is speculation that the shock may come from the combination of Iraq war costs, increasing terrorism, tax cuts, unemployment, weakening pricing power, and travel aversion. Whatever the merits to such speculations, a more sobering shock appears to be on its way. I am referring to Severe Acute Respiratory Syndrome (SARS), an infectious disease that originated in southern China around November of last year and can result in a type of fatal pneumonia. … Although I am not a financial expert, I wonder if this disease may become the needle or 'shock' that could pop the debt and derivative bubbles."

Maybe avian flu, after all?

Footnotes

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2 Derivatives: The Wild Beast of Finance by Alfred Steinherr John Wiley & Sons (1998).

3 ISDA = International Swaps and Derivatives Association, Inc. (a derivatives trade organization) See Frank Skinner's Pricing and Hedging Interest and Credit Risk Sensitive Instruments p.274 Elsevier Butterworth-Heinemann (2005)
Also, see Robert S. Neal and Douglas S. Rolph "An Introduction to Credit Derivatives" in Jack Clark Francis, Joyce A. Frost, and J. Gregg Whittaker Handbook of Credit Derivatives McGraw-Hill (1999) "Estimates from industry sources suggest the credit derivatives market has grown from virtually nothing in 1993". p.3.
There is also a very entertaining article which gives some insights into the development of the credit derivative market by Gillian Tett entitled "The Dream Machine: Invention of Credit Derivatives" Financial Times (March 24, 2006).

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5 Credit Derivatives: A Primer on Credit Risk, Modeling, and Instruments by George Chacko, Anders Sjoman, Hideto Motohashi, and Vincent Dessain Wharton/Pearson Education (2006) p.3.

6 See "Credit Default Swap Market Whipsawed by Verison (Update 1)" by Jennifer Ryan and Hamish Risk Bloomberg.com (August 8, 2006).

7 See Izzy Nelken's Implementing Credit Derivatives McGraw-Hill (1999)
"There is considerable uncertainty in the market about when an instrument is a credit derivative and when it is not. One definition of a C(redit) D(erivative) is any contract whose economic performance is primarily linked to the credit performance of the underlying asset. This definition would technically rule out T(otal) R(eturn) swaps, because their performance is only partially linked to the credit quality of the underlying and is mostly linked to the market risk of the underlying. " p.173.

8 See Frank Skinner Pricing and Hedging Interest and Credit Risk Sensitive Instruments p.280 "Credit default swaps … are actually default insurance."; Izzy Nelken Implementing Credit Derivatives p.5 "A credit derivative works very much like an insurance policy. … The credit swap market is very similar to the insurance and reinsurance markets."; Laurie S. Goodman Investing in Collateralized Debt Obligations p.144 "Credit default swaps are really quite simple – they are conceptually similar to insurance policies."; and Mark J. P. Anson Credit Derivatives p.44 "Credit Default Swaps as Credit Insurance" (Section Title) "This type of swap may be properly classified as credit insurance, and the swap premium paid by the investor may be classified as an insurance premium. The dealer has literally 'insured' the investor against any credit losses on the referenced asset."

9 Correspondence from Matti Peltonen, Chief Risk Management Specialist, New York State Insurance Department who cites a letter written by James Everett, Capital Markets Counsel, New York State Insurance Department (providing their legal interpretation in response to an inquiry asking whether credit default swaps constitutes insurance) dated April 30th, 2002. Also included in Matti's e-mail (of 3/16/07):

"The New York Insurance Department (NYID) consistently finds that derivative contracts are not insurance contracts as long as the payments due under the contracts are not dependent on proving an actual loss. For example, in considering catastrophe options (cat options) that provide for payment in the event of a specified natural disaster (such as a hurricane or major storm), the NYID stated that cat options were not insurance contracts. A cat option purchaser did not need to be injured by the event or prove it had suffered a loss from the event. In reaching this conclusion, the NYID distinguished between a "derivative product" which transfers risk without regard to an actual loss, and "insurance", which only transfers the risk of a purchaser's actual loss".

This distinction is not to be taken lightly. "Risk Transfer" (May 26, 2004) informs us:

"If a derivative contract were found to be an insurance policy, the derivative could only be sold by a licensed insurance broker. Thus a derivative counterparty that is not so licensed – one ultimately found to have been selling an insurance policy – would be acting unlawfully. In California, this would be a misdemeanour. In Connecticut, fines, imprisonment, or both can be imposed for acting 'as an insurance producer' without a license. Under Delaware law, a Delaware corporation can lose its 'charter' to do business if it acts 'as an insurer' without a 'certificate of authority' to conduct an insurance business."

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12 John Plender "The Credit Business Is More Perilous Than Ever" Financial Times.com (October 13, 2006).

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17 See John Frye "Collateral Damage" Risk (April 2000) pp.91-94 and
Michael B. Gordy "Credit VaR Models and Risk Bucket Capital Rules: A Reconciliation" Federal Reserve Board Working Paper (2000)

18 See "The Link between Default and Recovery Rates: Theory, Empirical Evidence, and Implications" by Edward I. Altman, Brooks Brady, Andrea Resti, and Andrea Sironi (March 2003) "Macro variables are added in columns 7-10; we are somewhat surprised by the low contributions of these variables since there are several models that have been constructed that utilize macro-variables, apparently significantly, in explaining annual default rates." p.16 and "Macro variables – as before – tend to have no evident effect on BDR (the weighted average default rate on bonds in the high yield bond market)." p.19.

19 John J .Binder "The Expected Recovery Rate and the Probability of Default on High Yield Debt" College of Business Administration University of Illinois – Chicago Working Paper (December 2006).

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29 See Credit Derivatives: Techniques to Manage Credit Risk for Financial Professionals By Erik Banks, Morton Glantz, and Paul Siegel (McGraw-Hill) 2007 Table 1.2 p.16.

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31 See Edward Chilcote "Credit Derivatives and Financial Fragility" The Levy Economics Institute of Bard College Policy Note (2006) p.1.

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