The Role of Derivatives in Creating the Financial Crisis

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INTRODUCTION

The reason I have been asked to write this paper and to address the prestigious symposium of the Al Baraka Group is that back in May 2007 I published a book forecasting the credit crisis. The title gives away its theme, being The Final Crash: Addictive Debt and the Deformation of the World Economy. The forecast was apparently bleak, calling for a crash in 2008 followed by a Depression in 2010. It was initially a 'gloom and doom' portrayal but my views changed as completion approached. This epiphany came courtesy of two discoveries; the first of which was Islamic Finance and the second a form of interest-free infrastructure finance undertaken and repeated for over a century in my home island of Guernsey, known as the Guernsey Experiment. I came to understand before the event that the so-called crisis would prove to be a blessing in disguise. It is natural to cling to the familiar, even though it has failed because we are fearful of the unknown. The longer we undergo flawed interventions in the form of further debt creation, the greater will be the delay to an era of enlightenment as we emerge from a Dark Age of interest-based finance.

For the purpose of this examination of derivatives I have indulged in a 'before and after' exercise by inserting Chapter 4 of my book at the beginning of this paper. Chapters 1 – 3 detailed the causes of what was then an impending crash in terms of the multiplication of bank debt via the housing bubble, profligate government policies and corporate conflicts of interests. Given that I used to manage a commodity-based hedge fund and was director of two others my views may appear hypocritical or at best a case of 'hunter turned gamekeeper'. As with all crises, we become seasoned professionals in the blame game after the event. After all, it is always someone else who is the speculator while we consider ourselves to be the investor. Before solutions can be discussed or debated, the first step is to look in the mirror and recognise our own guilt. Cynics may sneer at those who undergo the process of examining their own culpability, no doubt to avoid the process themselves. It is far easier to find fault in those who appeared to benefit on the way up, while conveniently ignoring the indirect spin-offs that came their way. Newspapers are a fine example of those whose advertising revenues were paid by the very people they now criticise.

What made my guilt worse than others is that I had already seen the benefits of interest-free finance and had taken and passed the Islamic Finance Qualification. It was a case of worshipping Mammon more than God but I am pleased to say that this is no longer the case. Little more than a year ago I was speculating in oil and commodity futures no doubt helping to increase the cost of living for the poorest people in the world. In the process of self-delusion I told myself that was that when I was short it was helping to keep prices down and when I was long it was adding liquidity. The likes of Gordon Brown were pressuring Saudi Arabia to increase production at a time when short term supply was becoming a glut. He was of course unprepared to take on speculators on his own doorstep whose actions were forcing up prices. I am now fortunate to be back onto the right path; that of Islamic Finance. Cynics may once again say that

I am following the money but I can assure readers that I have turned down highly remunerative conventional jobs to follow both my head and my heart.

Hopefully this discourse on derivatives will give a useful insight to those who are not regular users of these instruments. As one who used to be a speculator I am not going to come across as the predictable fanatical convert. Some of the best hedge fund managers are both highly intelligent and humble, sharing risk and reward and searching out the truth. To a hedge fund manager a short sale is the ultimate expression of disbelief and identification of corporate trickery. One can only wonder what such skilled people could achieve given the right incentive and an education in the true financial alternative. The Biblical expression of 'swords to ploughshares' sums up this hope nicely and would be the perfect metamorphosis of turning tools of financial destruction into implements of production. When a non-Muslim westerner talks about the benefits of Islam and the wisdom of the Prophet Mohamed (pbuh) he cannot be labelled as being 'one of them'. Let us hope that we can unite against the common, inanimate enemies of debt, interest and speculation. History shows that in times of duress we search for scapegoats in the form of foreigners or the 'enemy within', typically another race or religion.

As someone from a family of academics I openly acknowledge that I am left wanting on the scholastic front. I am writing this paper based on my background as both an investment manager and author. There is therefore a risk that some readers will dismiss my treatise as simply a collection of thoughts and opinions lacking scientific or mathematical depth. So be it. Readers who hold these objections can show me their documented warnings of the recent crash and I will be happy to be humbled and ridiculed for my lack of rigour. I have several biases against the academic approach to markets which should be disclosed at an early stage. Some of the worst elements of capitalism stem directly from Nobel Prize winners such as John Nash. On a personal basis it was anonymous Left-wing academics that were most critical of my forecasts at the review stage of my book. As my father explained to me, the greatest critics in University circles are those who possess little by way of original thinking themselves but attempt to make their name through undermining the work of others.

The worst element of intellectual involvement has come about since mathematical geniuses were recruited into financial markets. It is harsh to repeat the adage from the Victorian era, namely 'show me a mathematician in the City of London and I will show you a crook'. Time and again naive assumptions based on statistical theory, have led to substantial losses for investors because we assume that clever people can never be wrong. Worse still, they stick to their systems in spite of evidence to the contrary. This is in stark contrast to market traders, so often disparaged by their more qualified counterparts, who cut their losses and run. While this may be down to either intellectual or social snobbery, these traders have the advantage of being survivors who learn to live another day and ask questions later.

Like history itself, economic events have many causes and catalysts and derivatives must not be viewed in isolation. It is in our nature to pigeon-hole these elements into

simple black and white issues while overlooking the grey connections that bind them. A crisis has many layers and it is tempting to stop at the layer than re-enforces our personal bias. The onion skin must be peeled back time and again to find the core of the problem, even if it creates some tears in the process. It is common to regurgitate the Warren Buffett quote that derivatives are 'financial weapons of mass destruction'. Weapons play their part in a dangerous and destructive process but ultimately they are inanimate objects; it is the philosophy and implementation of their users that must be questioned and contained. What many people talk of as the cause are in fact symptoms of a bad philosophy that has crept up and infiltrated our institutions. At the very core of the credit crisis is credit itself; the mass production of money from money is eroding the purchasing power of the population. Human beings must be the only species that squander the legacy of the next generation, in stark contrast to others genus that will sacrifice all for the benefit of their offspring. Those whom we viewed as financial stewards have become salesmen and like a cuckoo in the nest, those who we thought of as siblings are proving to be parasites.

This paper assumes at least a rudimentary knowledge of derivatives including options, futures, contracts for difference and credit default swaps. It does not pad out the text with endless charts and tables but primarily gives my impressions and personal opinions on what has happened and what might lie in store. This lays me open to criticism if events do not conform exactly to my conviction, especially from the 'no one could have seen this coming' school of thought. My references in Part II of this paper are not as scientific as the first and have relied heavily on Richard Bookstaber (A Demon of our own Design; Wiley 2007) and Dr Sami al-Suwailem (Hedging in Islamic Finance; 2006).

Part I

The Final Crash: Addictive Debt and the Deformation of the World Economy (Chapter 4)

Gatecrashers

'There are two times in a man's life when he should not speculate: when he can't afford it and when he can', Mark Twain

The allusion to gatecrashers refers to the uncontrollable latecomers to the party in a much-enlarged hedge fund industry. Designed to reduce risk and enhance returns for the wealthy, these specialist investment funds have, ironically, become a time-bomb for financial markets.

GOT ANY GEAR(ING)?

Gearing is an appealing way to describe borrowing. As with the gears on a car or bicycle it implies that there will be a more efficient ride. Leverage is the American version of the same, implying strength through magnification of effort. The corporate mind-set is

forever coming up with such euphemisms to package the unpleasant. Before detailing hedge fund activities, we can witness the basic ingredients of gearing in a business. The principal is quite straightforward. First, one must find a viable project which will earn the investor more than a bank deposit. Further funds can then be borrowed to magnify the earnings from the scheme. As long as the returns are greater than the borrowing costs then a profit can be made.

No gearing

A $1 million project might generate returns of 15 per cent per annum = $150,000

With gearing

We can magnify the return if we gear up by 50 per cent or borrow $500,000. Instead of employing $1 million, a larger sum of $1.5 million can be put to work.

Return on combined $1,500,000 in a project at a rate of 15 per cent p.a. = $225,000

Cost of borrowing $500,000 at a rate of 7 per cent = ($ 35,000)

Return net of borrowing costs = $190,000

The earnings have expanded from $150,000 to $190,000 or by 27 per cent. In stock market terms, achieving that kind of growth rate is viewed very favourably. Although this example and its assumptions are over-simplified, the basic technique allows a company to change from sleepy to sexy. Even now, investors appear to be impressed by this feat. There is of course a downside. If inflation takes hold then interest rates will increase in response. Let us say borrowing costs rise to 10 per cent. In such conditions the opportunities are not so favourable in the wider economy. The rate of return may then fall to 7 per cent. Putting the figures back into this geared situation we find that the return net of borrowing drops to just $55,000. If the original $1 million project money had been deposited in a bank they would have received a similar rate of return but there would have been no risk. This is why businesses suffer from inertia and cease to invest as a recession unfolds.

Some companies have to use gearing as there is a long lead time between the beginning of a project and the payback. In a growth environment investors take more risks and actively seek such investments with more gearing beneath the surface. Smaller companies often fit this profile and performed well from 2002 – 05. When risk aversion returns, as no doubt it will, then investors will flee from such indebted companies.

Hedge funds may apply similar techniques to transform a reasonable return into a spectacular one. In the following example, loan rates have been used that were prevalent in the easy days of 2004 – 05. By borrowing many multiples of the assets, the magnification can be stunning. Even when the manager has little skill and cannot beat the stock market they can artificially expand what little return was achieved.

A fund worth $10 million goes to its bankers, or prime brokers, to gear up assets

They borrow $20 million (not uncommon)

The total combined assets available for investment now stand at $30 million

They achieve unspectacular returns of 7 per cent which generate $2.1million

The loan interest on the extra $20m at 4 per cent comes to $800,000

The overall return net of borrowing costs therefore amounts to $1.3 million

Investors see $1.3 million profit on $10m: a creditable 13 per cent return

Managers take 3 per cent management and 'incentive' fees for beating deposits

Investors ask no questions as they have received 10 per cent net of all costs.

Like our previous example, the process unravels with higher interest rates. In 2006, these expenses rose above 6 per cent. The rationale for gearing evaporates as these costs are virtually the same as the return on the borrowed assets. In days gone by, gearing was used to enhance what was already a good rate of return. In some cases it is no longer a single weapon but an entire armoury.

THE EMPEROR'S NEW CLOTHES

In the fairy tale by Hans Christian Anderson a crooked tailor tricked a vain emperor into parting with his money. He told him that the new royal robes were invisible only to fools. On being shown the imaginary material the emperor pretended to admire the cloth for fear of seeming stupid. His courtiers fell into the same trap to avoid being ridiculed. Their vanity and acquiescence held them back from speaking the truth. It took the laughter of an innocent boy in the crowd to expose the sham on the day of a public procession.

In 1998 a spectacular hedge fund crash saw one of the largest and most respected funds atomised in a financial black hole. It was called Long Term Capital Management or LTCM for short. The emperors were the board of directors who made up the role call of the great and good of both academia and Wall Street. The obsequious courtiers were the banks and brokers who bent over backwards to lavish services and credit to generate their fees. The humble peasants were the investors who bought the funds. Sadly there was no mischievous boy to laugh at the situation. Much like a beautiful stranger, the secrecy and mystique of such funds add to the passion and desire of investors. If the manager gives the impression that the fund's activities are so complex and secretive that they will move the market if disclosed, then investors become desperate for a piece of the action.

LTCM was set up by Jon Meriweather who was a star bond trader on Wall Street. The founders and directors included two Nobel Prize economists and other academics. The investment idea behind the fund was quite brilliant and concerned the convergent behaviour of government bonds over the long-term. It relied on small yield changes over time which could be magnified through the use of multiple gearing. As with the

courtiers who felt that they alone had the ear of the emperor, each bank was willing to lend generously, grateful that such a prestigious fund should give them the business. It transpired that LTCM were using some 75 counterparties1 (or financial institutions) to source their credit. The list of lenders reads like the Who's Who of banking. The fund had borrowed 50 times its capital leaving the financial system dangerously exposed when it crashed. Billions of dollars worth of derivative and bond investments was due to be unloaded into an already nervous market. The New York Federal Reserve orchestrated a private sector bail-out to prevent a wider financial crisis.

As ever, if an investment methodology is working well then no one questions it until the first cracks appear, by which time it is too late. In the case of LTCM the process worked wonderfully while the market was orderly. When the Russian government defaulted on $40 billion of its domestic bonds this caused a contagion or panic effect. Investors sold off less liquid foreign government bonds and fled into US Treasuries. This blew apart the two sides of the yield convergence principle and huge losses were incurred. Their models had not taken into account that during panics there is a liquidity crunch where safe assets perform well but illiquid (hard to sell) assets perform much worse.

The lesson from this episode is that hedge funds make some assumptions on risk, which can be difficult to offset or hedge. Value at Risk (VaR) models which stress-test the investments within portfolios cannot cover all the bases. One of the big selling points is that of a low level of correlation to stock markets with absolute returns achieved for a lower level of risk. However, in times of crisis bad events beget others: dirty secrets that were well hidden will suddenly emerge at exactly the wrong time. We are now being told that borrowing among funds is low by historic standards. This does not take into account the possibility that those assets may be invested in derivative products that are already highly geared. When an investment is founded upon multiple layers of leverage it has a habit of destabilising when pressure is applied. If one suggests a possible repetition of LTCM at swanky hedge fund conferences the patronising head-shaking routine comes to bear. 'Our risk models are different this time around'. Perhaps they are really saying 'can we interest you in some of this lovely cloth…?'

HEROES AND HORRORS

There is some debate over who was the first hedge fund manager. In Barton Biggs' Hedgehogging he suggests that economist John Maynard Keynes should be credited with the title.2 Legendary investor Warren Buffett instead puts forward his mentor Benjamin Graham as an early example of such operations in the 1920s. Rightly or wrongly, an American called Alfred Winslow Jones is most often cited. He set up a fund in 19493 and first came to prominence in 1966 when his skills were brought to light in Fortune magazine. Within 2 years, some 140 similar funds were on the scene. In the distant past, whenever the stock market fell, the majority of investors would suffer as there were few safe-havens. Hedge funds can reduce some of these risks by protecting themselves in a process known as hedging, often using derivative contracts.

The latter have been in use for over a century in the arena of real goods or commodities, providing protection against falling prices. Speculators take on some of these risks, operating between farmers and food manufacturers, in the hope of making a profit.

Hedge funds can take advantage of these insurance mechanisms to reduce their volatility and enhance their potential. Those with proper risk management can provide reasonable upside performance but lose less on the downside compared with conventional portfolio managers. As well as buying stocks they favour, fund managers can also make money from shorting the ones they dislike. 'Going short' means that one can profit from a price decline. It involves selling a share that you do not own then buying it back at (hopefully) a lower price, thereby profiting from the price difference. Before everyone rushes out to become short sellers, there are some cautionary tales to observe. First, if you own something, the price cannot fall below zero so you have limited downside. However, if you sell a stock that you do not own and your judgment is wrong then your losses are unlimited. This is for the simple reason that a price can rise to infinity but can only fall to zero. Second, the most obvious things to sell have already encountered plenty of bad publicity so the negative sentiment will already be factored into the price. The life of a short seller is a lonely one, requiring intuition, contrarian thinking and a dose of luck. Few investors possess such skills.

Some of the most famous managers such as George Soros, Jim Rogers, Bruce Kovner and John W. Henry, to name but a few of many, have shown that skilled investors can and do beat the markets: not necessarily year-in, year-out but over reasonable time frames. Their funds come in all shapes and sizes with a mind-boggling array of strategies. Hedge funds used to be the preserve of the super-wealthy and were often restricted to Limited Partnerships of less than 100 investors. In some cases they are by invite only. This stemmed historically from exemptions within regulations drawn up by America's SEC (Securities Exchange Commission). They included the Securities Act (1933), the Securities Exchange Act (1934) and the Investment Company Act (1940).4 By carefully following the rules, it allowed hedge fund managers to invest with very few restrictions compared with their tightly controlled counterparts, the onshore mutual funds. The general partner was also the investment manager and they would place a large portion of their personal wealth into the fund, thereby giving investors faith that monies would be managed responsibly. By domiciling the funds offshore with large minimum investment sizes, they receive much less attention from regulators given that inexperienced investors do not usually get involved. Those who are wealthy enough to buy them should have a good idea of the risks involved and a greater immunity against losses, should they come to fruition.

Hedge funds in their own right have been great investments for many years. Some of the managers are the most interesting, intelligent and insightful people one could hope to meet. They deserve to be wealthy because they have made money for their clients in good times and bad while sharing the risk in the process. However, there are many managers who have been distinctly average, particularly those who have arrived late on the scene. The line between gearing and skill has become blurred, although this can be

calculated using the latest quantitative techniques when analysing price moves. With the rise in US rates, gearing's diminished effectiveness is separating the men and women from the boys and the girls. Many new funds have chased higher risk markets to boost returns, drifting into areas well outside of their expertise: such as sports teams and film productions, 5 notorious for their uncertainty. The meltdown of Amaranth (which traded in natural gas futures) is a case in point, losing billions of dollars in September 2006. It appears that the market can cope with individual fund crashes but it remains to be seen if rescue packages can be worked out should multiple failures occur.

It has not always been an easy ride for these funds. In the late 1960s poor market conditions brought on hefty investor outflows. The assets under management for the largest funds were drained6 by some 70 per cent. Even in modernity it can be tough to survive. Wall Street legend Barton Biggs points out in his book Hedgehogging that some one thousand funds went out of business in 2004. This was a near-perfect year for accommodative interest rates. Because of their success during the 2000 – 02 bear market in shares, the popularity of these absolute return funds exploded. From barely a few hundred 20 years ago, their number grew to 600 in 1990 then to 3,300 by 1998. Some 8,800 are now in existence.7 By 2004, assets under management had swelled to a staggering $1 trillion in value (one thousand billion). This compared with some $7 trillion invested in US mutual funds and around $30 trillion worldwide in conventional pension and investment funds. By September 2005, hedge fund inflows had continued to grow; bringing the overall total8 to an incredible $1.4 trillion. Their true purchasing power is anyone's guess, given the level of gearing that can be generated from this asset base.

The funds play a significant role in the market and can even reduce risk in illiquid areas when searching for inefficiencies. They also punch above their weight in terms of trading volumes on the stock exchange, reaching up to half of daily turnover9 in some markets. This is because they are such active traders compared with traditional investment managers who tend to buy and hold investments for longer periods. Because they can have a large variety of assets in their portfolio they are very well spread, or diversified. Instead of just being stuck with traditional shares and bonds they can go short or take on exposure to oil, precious metals and different currencies. If there is an asset that moves in price and a futures market to hedge the risk, then you will find these funds.

In so-called arbitrage they can play both sides of a trend by purchasing a takeover target (whose shares will rise) and shorting the acquiring stock (whose shares will fall when, as usual, the buyer pays over the odds for the company). They have even become major players in the energy market by stepping in when Enron collapsed. The multiple styles and strategies have meant that they have traditionally enjoyed low correlation with conventional investments. In the past, some would actually benefit in declining markets or at least not fall as much. The layers of different strategies tend to preserve wealth in a downturn in the classic case of not putting all your eggs in one basket.

This is beginning to change. In the past five years, returns have halved to just 8 per cent per annum compared with an average of 16 per cent per annum10 in the 1990s. We see that greater risks have been undertaken to generate what are lower rates of return than in the past. One piece of evidence for the rise in mediocrity can be seen by examining the rolling returns of the average hedge fund versus the average portfolio manager11 with 70 per cent in equities and 30 per cent bonds. The returns of both are not only similar but also reveal a striking correlation to the stock market as a whole. Their ability to diversify away from equities appears to be weakening, especially since early 2003. In this unsatisfactory environment of higher risk and lower returns, the management fees have been expanding. In 2005 these fees amounted to a stunning $16 billion12 according to Hedge Fund Research Inc.

As alluded to in the sub-title, the shrewd and nimble heroes have been crowded out by horrors tapping into their success. The markets are generally efficient so bargains are few and far between. When you have just a few players exploiting anomalies then it is a sustainable situation. It is rather prospecting for gold where a few pan-handlers make some great finds and the environment is unharmed. When word of a gold strike gets out, there is too little to go round and the hills are ruined by soil erosion and cyanide. By the end of the rush, the only people making money are those who sell the picks and shovels to the hopeful late-comers. Time and again we take a process that works well then abuse it such that it eventually withers on the vine. Our attitude to nature is likewise unrelenting and exploitive. We revel in her fruitfulness yet destroy it by industrializing the production process and polluting the very source of its growth.

This phenomenon appears to be happening with hedge funds now. There are too many players crowding into a limited market like an excess of predators with too little prey. To make matters worse, a new breed of investor has joined the fray. To avoid the risky nature of being exposed to one single hedge fund we now have reams of funds of hedge funds. They are so numerous and similar in nature that they resemble a colony of penguins, looking and sounding the same. As ever, one should be careful to avoid generalisation, as there is a minority of notable exceptions to the rule. Such products typically package between 20 and 100 hedge funds encompassing hundreds of strategies with no doubt a great deal of overlap (and plenty of hidden charges). Instead of picking specialist dishes off the menu, investors are getting every possible assortment mixed into a glutinous porridge. This approach is often bland and uninspiring. They exist because there is too much risk of a single fund going into default so one needs to hold a variety to diversify. The lack of transparency makes due diligence difficult for the ordinary investor so they rely on a fund of fund manager to do it for them. People within the business understand that fraud in a little-regulated area is more likely compared with a listed company which is regularly reviewed by analysts. Although tiny in proportion to the number of funds, the number of civil case actions13 brought by America's Securities and Exchange Commission (SEC) has risen from 10 in 2002 to 29 in 2005.

Perhaps the best sign that the industry is close to maturity is the news that pension funds14 are looking to increase alternative asset exposure. These retirement funds

dwarf every other investment animal, having accumulated huge sums over decades of contributions. If pension trustees allocate even a small percentage into hedge funds it will squash any hope of achieving excess returns. The managers find it difficult enough to invest existing assets effectively: the best have already closed their doors to new money. Some of the areas where hedge funds operate are like meadows of delicate wild flowers. Let in too many ramblers and they will trample the very thing they have come to savour.

There have already been several portents of the dangers that lie in wait. Their battering in the spring of 2004, 2005 and 2006 should have been enough to make new investors approach with care. Although there was some reduction in gearing after 2004, it was obvious that there was no wholesale clear out of leverage. A dollar devaluation or further rise in bond yields would cause chaos for these funds, many of which would be driven to a forced liquidation of illiquid assets across the world. When everyone funnels toward the same, narrow outlet a log-jam ensues. Prices can fall spectacularly under such conditions.

Some fund managers had previously complained about the lack of market volatility which had reduced the opportunities. They should have been careful what they wished for. Although interest rate rises had been well-flagged and discounted, it seemed to come as a surprise to many of these managers. In the spring of 2005, markets sold-off as hedge funds reduced their gearing in tandem because borrowing costs mounted. Assets had to be sold to pay back the loans. Up until that time the funds had been borrowing in dollars and investing overseas. When borrowing in a weakening currency it is favourable because the size of the debt shrinks when you repay the loan. The realisation dawned that as US rates rose, it would create a suction effect on the world's capital which was then drawn toward America. The dollar began to strengthen and caught many on the hop. For hedge funds the damage came in four uneasy hits to their performance:

The cost of borrowing increased.

The dollar strengthened leading to foreign exchange losses on non-US investments.

The simultaneous liquidation strategy of so many funds worsened the price declines.

As they all rushed for the same exit, the correlation of unrelated assets began to rise.

Borrowing in dollars meant they were 'short' of the currency. When it strengthened, they made losses on overseas investments. Dollars had to be bought back to reduce risky gearing. A 'short squeeze' then followed which drove the currency higher still. Speculators never seem to learn this simple lesson. In early 2006, dollar investors lost around 25 per cent when tempted in by the seductive high yields on Icelandic bonds. As the trap-door opened, the currency bombed and bond prices followed. High yield bond markets from the Arctic to Africa were also ditched, creating a self-feeding fall.

One selling point of hedge funds is that they are meant to complement your portfolio by reducing the correlation across different assets within it. If investments move in

the opposite direction to each other then that is negative correlation which is a good thing as it allows one's portfolio to stand firm in a variety of conditions. With too many funds and too few opportunities, the performance of risky investments across the world has started to converge and correlate, 15 thereby negating the diversification benefits of the original investment philosophy. Instead of being strong oaks, many funds have turned into saplings that bend with the wind. If evidence were needed of their diminishing opportunities one can look to the stock market for clues. Listed hedge fund companies16 carry rather dowdy valuations. This implies that analysts view their performance and business models as exhibiting low growth potential, which does not sit well with the marketing material.

MINDERS AND BOUNCERS

There is a terrifically difficult balancing act where hedge funds are concerned in attempting to match sensible regulation with innovation. On the one hand you have the investment banks known as prime brokers. They act like footballers' agents who pamper the stars and look after their every need. Investment banks make all the arrangements for hedge funds' dealing, borrowing and general banking. They are very well rewarded for their services and in this sense they are the minders.

On the other side you have the bouncers who are trying to keep order and prevent the bad apples entering the system, known as financial regulators. They are becoming more and more concerned about the amount of gearing and derivative activity sloshing around the financial system. Much like the Lloyd's insurance market of the 1980s, you may be able to hedge or insure your bets but it is unclear where these risks are accumulating. So what can regulators do to come up with an overall score of hedge fund gearing and risk? The answer is that they cannot do so all along the chain but they can monitor the activities to some degree. Many of the individual managers are based on-shore in major capitals such as New York or London. So too are the investment banks that lend them money, as are the dealers with whom the funds place their trades. The problem lies with the fact that many funds are based in offshore jurisdictions. While some have listings on well-regulated stock exchanges such as Dublin, this is done to lend an air of respectability rather than being a guarantee of investor protection.

The FSA, Britain's financial regulator, has been investigating the activities of a high profile hedge fund with billions under management. The head of wholesale banking regulation, Tom Huertas, summoned the 30 biggest funds for a meeting to warn them against market abuse. Another of their leading officials, Hector Saints, 17 said 'some hedge funds are testing the boundaries of acceptable practice concerning insider trading and market manipulation'. In America, the SEC attempted to increase transparency by making hedge fund managers register as investment advisers in February 2006. The amendment of the 1940 Investment Advisors Act was rejected a few months later in June when a manager called Philip Goldstein took the SEC to the US Court of Appeal and won. Since the Amaranth crash, regulators from both the UK and USA have wisely

called for a borderless control of derivatives. One can only have sympathy for their role, of having to hold a tiger by the tail.

The Achilles' heel of hedge fund transparency goes back to the old chestnut of a potential conflict of interest, which is the curse of every boom. This time around it may well be the incestuous relationship between investment banks and hedge funds. New managers frequently find that they cannot attract money without real performance yet they cannot establish a performance history without real money. Unless the investment manager is a household name the fund will need initial money called seed capital. An investment bank may well provide this money as they are always looking for opportunities. There is however, a price to pay. In return for seed capital the investment bank will expect to receive reciprocal business for their largesse. There is always potential for conflict when you have an industry that benefits from selling to itself. Collectively, it would appear that the prime beneficiaries of servicing the hedge fund business are those who are best positioned to spot potential problems. Like so many previous examples, it may be difficult to ask too many questions or rock the boat.

Investment banks earn money from hedge funds in the ultimate example of cross-selling. First, the assets need to be held somewhere so a custodian bank account can be set up to hold the investments, for a fee of course. Second, when a trade is placed in the market a dealer is provided and commissions will be earned. Third, they provide contractual settlement whereby the hedge fund manager can deal with virtually any broker without having to go through all the usual mounds of paperwork. Fourth, and most important, they provide borrowing facilities to gear up, including stock lending for going short. Every need is catered for by the friendly prime broker.

Having seen a slump in the early 2000s, the investment banking world went through some lean times, but the prime brokerage business proved to be a godsend. Credit Suisse First Boston18 estimated that hedge funds generated around an eighth of worldwide investment banking revenues in 2004. This figure came close to $19 billion. A further $6 billion was generated from prime brokerage services of granting credit and providing custodial services for trading. Looking at the crude mathematics of the business, it would seem that the prime brokers made $25 billion on $1 trillion of hedge funds which equates to 2 ½ per cent of the total. If investment managers are taking another 2 per cent as performance and management fees then the funds will have to churn out returns in excess of 4 ½ per cent annually just to break-even. It is little wonder they use gearing of between 100 – 500 per cent to achieve their aims. No matter how it is dressed up, high gearing is high risk, especially when interest rates are on the ascendant.

PASS THE PARCEL

Having been the preserve of the very wealthy, being a Name at the Lloyd's insurance market in London was opened up to a wider audience. By a curious coincidence this

was the period when asbestosis cases started to emerge. These individuals would act as guarantors to the insurance companies. If the claims were no greater than expected they would reap a reasonable reward which could pay the school fees. In the rare event that anything went wrong then there was a danger that they could be called on to contribute towards the insurance claims. Years of apparent success built up apathy and high expectations, rather like the property market today. Much like bookies, insurance companies like to offset their risk. This is where re-insurance companies come in to reduce the potential losses. In the children's game of pass the parcel, when the music stops, the child with the multi-wrapped present must unpeel a layer to see if they are the lucky winner. For insurance companies the parcel is not a prize but a punishment as they are left to pay out a large claim. By dividing out smaller parcels of risk, the liability is spread around more evenly. It should always be remembered that these risks do not simply disappear as they are always somewhere in the system.

For anyone who has supervised a children's party, they will be familiar with the spoilt child who will not pass the parcel to stand a greater chance of winning. Insurance risks similarly converge in the wrong areas as speculative re-insurers become greedy and take on too big a share. Like toxins in a food chain, risks concentrate and emerge in the most unexpected of places. As re-insurance syndicates took ever-greater gambles, some did not appreciate how exposed they would be in the event of a disaster. This may well provide a parallel with some hedge funds today.

The Lloyd's fiasco was a fine illustration of how risks are not properly estimated and complacency reigns supreme where a 'good thing' is concerned. When it turns sour, there are knock-on effects that reinforce the Law of Unintended Consequences. Names were simultaneously forced to sell their mansions and London maisonettes in the middle of a property slump, thereby creating a glut of similar properties on the market. The inevitable price decline set in and bargains abounded. This is why it is so important to build up cash rather than debt at the peak of a boom. Another unexpected side-effect could be found in the fine art market which was swamped when demand was already thin on the ground. These are usually the first items to go when wealthy families are faced with bankruptcy or inheritance tax. A salutary lesson can be drawn: when a downturn takes hold, from whatever source or quarter, you must not be one of the panicking herd selling assets into a falling market, be it for shares, property, fine art or even fine wine. It is far better to be a bargain basement buyer.

The thorny topic of credit derivatives, or synthetics, has echoes of the Lloyd's insurance market. After the Savings & Loans crisis, we saw how banks borrowed cash to buy higher yielding government bonds to profit from the difference in yield. Hedge funds have gone several steps up the risk ladder using the same method. Instead of buying government bonds they have bought emerging market debt instead. Riskier still, they have acquired bonds from highly indebted companies such as General Motors (GM). To protect themselves against the risk of such companies defaulting, or not meeting interest payments, some funds bought insurance on GM bonds in the form of credit derivatives. Because of its deteriorating financial position, GM's bonds were

downgraded in 2005 so the price fell and the yield rose even farther. By holding credit derivative insurance some funds were able to protect or hedge themselves. Judging by the scramble to buy the insurance after the downgrade it appears that many funds were not properly insured. They had been hoping, as usual, for the best outcome19 without preparing for the worst.

The concern about credit derivatives is three-fold. First, there has been a massive growth in their use. In 2004 the market increased by 123 per cent, creating an exposure of $8.4 trillion20 to these instruments of insurance. In 2005 they grew by 105 per cent such that their so-called notional value stood at $17.3 trillion21 which is in excess of all outstanding corporate debt on the planet.22 The total derivatives market across all sectors is worth a stunning $298 trillion. Much like the Lloyd's re-insurers, someone somewhere must be exposing themselves to these credit risks. For the second concern, these contracts are traded over-the-counter between banks and do not pass across an exchange where regulators would be able to monitor their activity. Third, the paper-based system for confirming trades is so old-fashioned and snowed-under that it is taking up to a fortnight23 to settle some deals. The problem became so acute that several leading investment banks were summoned in 2005 to see the New York Federal Reserve in order to introduce an electronic system. A year on from this meeting, things have improved but deficiencies remain, particularly with the lack of contract standardisation. Should a corporate default occur, and the credit derivative contract has not been settled, then the party that is meant to pay up may attempt to renege on the deal. Although unlikely in current conditions, in the event of widespread bankruptcies – which are typical in a slump – it may be used as a survival tactic for those who entered the market thinking that writing insurance was a doddle. While we have emphasised hedge fund risks, we should spare a thought for another source of leverage which is growing in the form of private equity funds. They raised $260 billion24 in 2005. The threat of takeovers from such funds has led the management of many listed companies into gearing up to improve their returns; just when the opposite course of action should be followed. Although such funds have been around for two centuries, they are using huge gearing to buy companies, strip costs the bone and sell them on at a profit. These deals are getting out of hand in terms of size and it is likely that a mega-deal will mark the pinnacle of such vulture-like corporate raids. When a large company gets taken over by a small private equity fund with massive gearing then it will be time to back away off from these investments. The costly takeover of Germany's Mannesmann by Vodafone in early 2000 marked the peak of the peak of the TMT. It would be the ultimate irony and top-of-the-market act of hubris should Vodafone in turn be taken out in this manner.

Debt is overwhelming consumers as interest devours disposable income through mortgages, loans and credit cards. Western governments are no better, running up a burden of deficits for both the present and the future. Investment banks and hedge funds have added to the mire. We have had our fun in the boom times: a hangover is inevitable.

CHAPTER 4

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Part II

Part II
A FAILED PHILOSOPHY

It is well over two years since the book was published. While many of its forecasts have come to pass there were some elements that did not namely, developing country decoupling and dollar devaluation to name but two. These are events that may yet unfold in the fullness of time. The purpose of Part II is to expand on the derivative theme and examine its role in the financial crisis. Derivatives are just part of a three-dimensional jig-saw of complex human behaviour and by necessity we must touch on related areas in this discourse.

Some excitable commentators have at various times applied the term 'Apocalypse' when markets were unravelling. In spite of its end-of-days overtone, the word derives from Greek and literally means 'unveiling' which is a very apt description. The great beauty of the credit crisis is its revelation of some ugly truths. Right at the heart of the recent turmoil is a flawed philosophy. It is a philosophy that front-loads future growth and artificially expands the economy through borrowing. The numbers do not lie. In 1970 credit market debt stood at 1.3 times GDP in America but this figure now stands at 3.7 times. It appears that much of the so-called 'growth' of the modern era has been an exercise is in accumulating debt. This is the 'dirty secret of capitalism', which was recognised by Ben Funnell of GLG, the leading hedge fund firm in London (Financial Times 1 July 2009). On a domestic level, Anglo-Saxon populations were encouraged to live beyond their means via credit creation, translating into corporate earnings that were clearly in a bubble. Even conservatively-run companies had little choice but to gear up in order to stave off unwanted pursuit by private equity predators. This in turn added to layers of liabilities that have of course destabilised both the economy and financial markets. Debt has also ensnared developing countries in a vicious circle, forcing them to export their natural resources and open up their domestic markets to foreign (usually subsidised) competition from western manufacturers.

It is very easy to sound conspiratorial when talking about a cartel of wealthy elite and Wall Street banks causing (and benefitting from) the crisis. Whether by accident or design the results do lend weight to these concerns, especially when Goldman Sachs paid out bonuses averaging close to £ ½ m per employee; not in 2007 but in 2009. The fortunes of a minority of the population appear to be in stark contrast with the experiences of the majority of the populace in America. According to research by Société Générale over a period of nearly 40 years (since the Gold Exchange Standard broke down) the top fifth of US earners have seen a 60% increase in their inflation-adjusted earnings. Meanwhile the remaining 4/5th of the population has seen a decline of 10% over the same period. Income disparity is a fact and affects the very people who are sold a dream of consumption. Endless advertising encourages the accumulation of long-term liabilities in return for short-lived junk products.

Capitalism was supposed to lead to a trickle-down of wealth creation and ownership for all, at least it might have done had the original principles on money supply constraint

been adhered to. This is where many people confuse trade with capitalism. The latter is a mechanical, unhealthy philosophy while trade is productive and beneficial human activity. The fuel of the capitalist-orientated banking is debt creation (or credit creation, depending on whether you are selling or receiving it). Unlike examples of co-operative symbiosis in nature, parasitical activity is ultimately dysfunctional. In the case of banking in its current form it does not aid trade and business; it ultimately destroys what it was meant to serve. Like any selfish parasite it moves from host to host until none is left. Interest-based debt formation is not just theft from this generation; it is theft from the next. Ever-rising prices for basic necessities coupled with environmental destruction is not a formula for progress but for poverty; both spiritual and financial.

So where do derivatives fit into the picture? For the sake of stating the obvious, derivatives provide a fast-track mechanism failed philosophy but are not in themselves the cause of the failure. They simply magnify, accelerate and exacerbate what was already faulty in the first place. We are masters of euphemistic language and can provide a sugar-coating to the most unpalatable of topics. Former US Federal Reserve chairman Alan Greenspan portrayed derivatives as instruments that offered 'flexibility' for the financial system. If the definition of flexibility means geometric growth in financial tools that have few end-users or productive purpose then he is correct. Likewise, in the formative phase of the Federal Reserve in 1913 the rationale for its creation was to provide 'elasticity' for the money supply. It is unlikely that Congress was expecting a 98% decline in the purchasing power of the dollar in the nine decades that followed. Modern finance is similarly dominated by a mutation and distortion of products which were once-useful in moderation. Both Islamic and conventional finance have been subject to so-called innovation with at best tenuous economic benefits. The great advantage of Sharia Law is that it receives guidance from the Holy Quran. Time and again its directives nip problems in the bud by forbidding them altogether rather than tolerating small doses which might escalate. This applies as much to alcohol and lust as it does to interest-based liabilities. Instead of allowing a degree of speculation whose end justifies the means it is prevented from taking root in the first place.

The great sickness of the last century has been the private creation of false money in the form of bank credit. Its initial symptoms of rosy-cheeked prosperity were the pre-cursor to ashen-faced penury where excess stimulation and bail-outs poisoned the vital organs of the economy. Current dogma demands that growth must resume at any price, no matter how much debt is dumped on future generations. 'Legacies not Liabilities' should instead be the modern mantra. There is a corporate and government imperative to intervene and 'do something' but asset prices should be left to find a floor and establish a new, much lower equilibrium; the sooner the better. Attempting to stave off the inevitable will worsen the outcome in direct proportion to the time spent in pseudo-stimulation mode. The wholesale dilution of our money will soon become clear when bond yields spike and currencies plummet relative to real assets like gold and commodities.

Anglo-Saxon governments continue to be advised by apparatchiks of a failed financial system who believe that bailing out banks is pre-requisite for saving the economy. Like quack-doctors of old, financiers have come to believe their own bogus diagnosis that further debt creation is just the tonic. Applying more leeches is not the cure, but the cause of our economic anaemia. Governments understandably wish to help, the public cry for assistance, but banks sit in the middle. They cannot lend money because their off-balance sheet liabilities are a monstrous black hole that suck in capital and atomise it. Fractional banking mimics the parasitic cuckoo that gorges on the offerings of the hard-working hosts while stealing from their starving siblings. This is not to say that banks should be eradicated as the majority of bankers are both decent and diligent. The mentality of the mob blames anyone but themselves and has many dangerous precedents in history.

The idea of bailing out banks was to help the economy, not to help banks. After all, we were told that the economy could not function without financial institutions so when the public bailed them out, there was an expectation that they would lend money once more, to the very people who protected them from collapse. The fact that bank lending continues to freeze and mortgage rate margins remain painfully high speaks volumes about the true nature of the banking system; a selfish entity that does not exist for the benefit of the economy but for its own ends. Economically we still cling to what was utterly unsustainable. The surge in debt and money supply is an attempt to get back to a place we should never been in the first place, like Icarus flying too close to the sun. The high water mark of 2008 should therefore be looked on as a layer of scum left behind after a disastrous flood; one that should induce loathing, not longing. It is understandable that so few can comprehend the big picture; that the downturn is a blessing in disguise which can only be appreciated many years hence.

Caught up in consensus, market analysts could not comprehend that corporate earnings were generated from cosmetic credit creation and were a bubble in their own right. The same people are now dishing out talk of 'green shoots' when a year ago they refuted any suggestion of a recession. Their risk-weighted-probability models couldn't see a crash coming and should not be given credence for calling the bottom. Given that there were 7 bear market rallies in the Great Depression the recent rally should be used to liquidate rather than accumulate. It is fashionable to rationalise financial markets in mathematical terms simply because they involve lots of numbers and it is data that is fodder for analysts. The role of human nature is often overlooked because it is hard to analyse and is seen as unscientific and even moralistic. However, derivatives play a crucial part in magnifying human weaknesses. The best traders and hedge fund managers equate money to a way of keeping score for their intellectual theories on where the world is going. When money becomes the target of the game rather than a unit of measurement then fear, greed and losses trample over discipline and models. When the Singapore-based trader Nick Leeson brought down Barings through his futures trading activities, there is no reason to disbelieve his story that it all began with a little lie. What began as a cover up of a small loss by a colleague ultimately led to fraud and trading on a massive scale. As losses mounted he took ever-greater bets to

cover his tracks, even writing options to generate an inflow. His actions are a textbook example of behavioural finance where multiples of downside risk is taken on, especially when the probability of a negative outcome is statistically small. Desperate traders will take on ever-greater risks to win back losses which in turn escalate far beyond the initial loss.

BLACK SWANS AND BLACK SCHOLES

Those who gained most from talking up markets are first to play the innocent with claims that no one could see it coming. Nassim Taleb, author of The Black Swan: The Impact of the Highly Improbable is a good example of several authors who proved that this was not the case. Perhaps one should not be too harsh on the majority of financiers who were in no position to voice their concerns, let alone do anything about it. After all, sales targets are not just a carrot, they are also a stick and clients don't appreciate a cautious approach in a bull market. In January 2009 at the Davos economic forum, Taleb was reported as saying that trading derivatives is solely about finding a way to take advantage of clients. While the private comment may well have been off the cuff, it would certainly ring true for the many pension funds that bought into the concept of AAA mortgage backed securities. Writing in the Financial Times (14 July 2009) Taleb highlighted the robustness of equity compared with the destabilising effect of debt. While equity volatility is visible, debt-based risks are not, except when in default. Banks should therefore move away from accumulating hidden risk to become agents of economic activity. This is exactly what Islamic financial theory is all about.

Like many incidents in the credit crisis we see how assumptions have proved to be the Achilles' heel of analysts. The Black-Scholes model is a useful tool for pricing options in a normal market and where users understand the limitations. However, it is a classic example of a process that disagrees with reality and is founded on approximations, assuming instant, cost-free trading while under-estimating extreme price moves. The failures of Value-at-Risk (VaR) assumptions that exclude abnormal markets are also well documented and lead to false sense of security in risk-taking. It is not subadditive meaning that the sum of an institution's risk can be greater than its parts, in the same way that dilute toxins unexpectedly accumulate and concentrate going up the food chain.

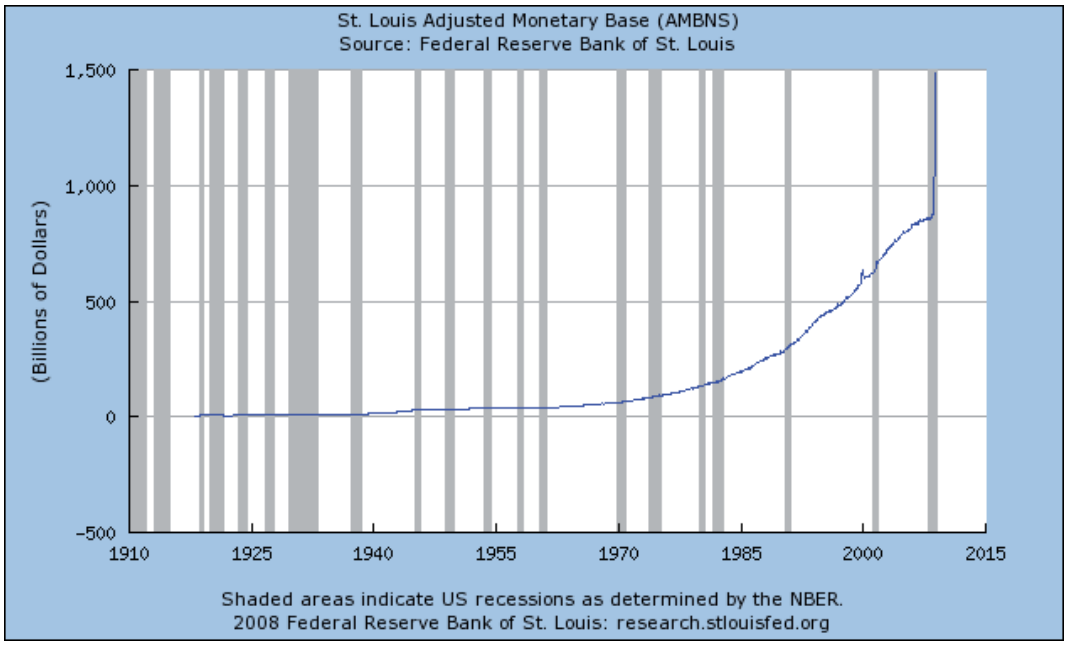
So how predictable was the recent crash? To make this sort of prediction required the realisation that we were in a bubble, made more difficult because they are often confused with genuine, fundamentally-driven booms. In the oft-quoted tulip mania the wealthy simply paid for rare tulip bulbs based cash-on-delivery. It was only when the public became involved that common bulbs were hoarded and traded with forward markets created to meet the speculative demand. Any informed analysis of bubble markets will show that they have a primary and secondary aspect. The first phase involves the wealthy and professionals who are pulled into an idea with good fundamentals which becomes a mania. The subsequent collapse leads to a bail-out because such people have

a strong lobby. The Law of Unintended Consequences then sets off a second unrelated bubble when attempting to reflate the first. This is the most dangerous of them all because it draws in the public who should not be speculating in the first place. It is now obvious that Technology shares were was the primary bubble while the housing market was the secondary.

For anyone with access to financial research it would have been clear that the Internet craze was indeed a bubble and that rocketing PE ratios were unsustainable. It was all-too-easy to be caught in the euphoria as the new Millennium approached. Following that, the combination of bail-outs after the 2000 crash and 9/11 was the catalyst for the secondary bubble. The mass creation of credit coupled with consumption encouraged by the Federal authorities caused enormous distortions within the economy. While most people were not privy to charts showing the massive deviation of corporate earnings from their long-term average no one can claim to have been oblivious to what was going on in housing. After all, there was no escape from the plethora of property-related television programmes. The rise in price of real assets such as property is often a symptom of a currency being diluted. It is just a case of needing more mass produced money to buy the same item. As we know from numerous manias a supply/demand story is conjured up to make fundamentals fit the price action. Demand is often a function that follows price action rather than reflecting a fundamental trend. By way of example this can often be seen in the gold market where investors chase prices up while industrial/jeweller demand conversely hunts for bargains.

One doesn't even have to know about economics to spot a bubble or something that can at best be described as unhealthy. The easiest method is to look out for charts that at first drift along then soar up the page. One can argue whether such charts are geometric, exponential or parabolic but sometimes they can only be defined after the event. Either way, common sense is a valuable instinct that identifies excess growth like angry colours in nature. We see these patterns with the spread of viruses, the self-destructive creation of alcohol by yeast cells and of course cancer. These natural examples give wonderful warning signals of an escalation that will eventually implode. On a larger and more ominous scale it can be seen with the growth of greenhouse gases and the effect from compound interest on debt. So where can we see similar signals now? Take a look at the production of base money from euphemistically-called quantitative easing and the continued growth of derivatives (see charts overleaf).

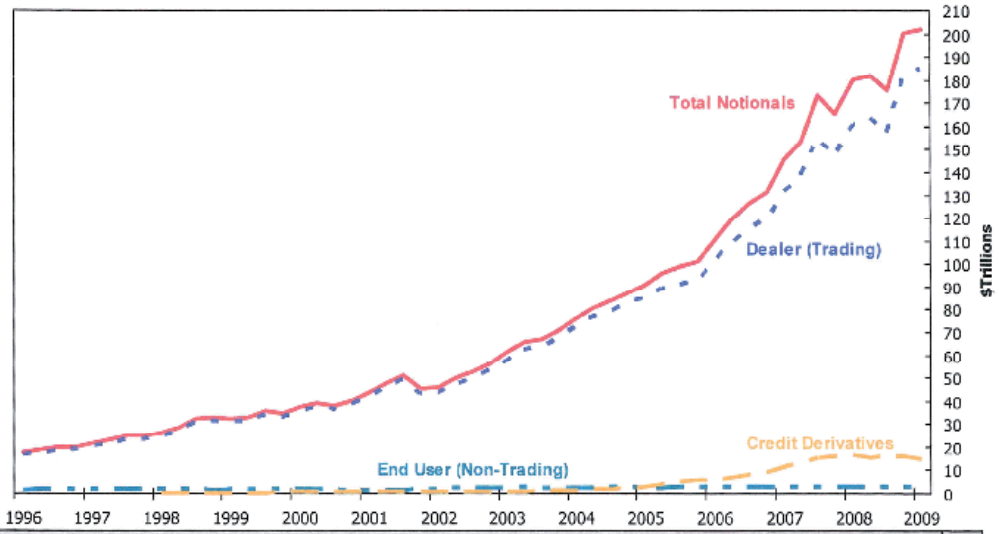
We have clearly learned nothing from previous bubbles and the conflicts of interest that allow their expansion. If only we could stop intervening and allow the price mechanism to do its job quickly and effectively. Many blame the Federal Reserve for the Great Depression because of their unwillingness to cut interest rates aggressively after the 1929 Crash but this was in effect another form of intervention. They were trying to protect the dollar. This time round no one gives a damn about the dollar. Perhaps the Fed members of the 1930s may prove to be smarter than we thought once we see the spin-off effect from its forthcoming devaluation and consequent surge in bond yields.



Derivatives Notionals by Type of User

Graph 1

Insured Commercial Banks



	2002				2003				2004				2005				2006				2007				2008				2009
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Total Derivative Notionals	45.3	50.1	53.2	56.1	61.4	65.8	67.1	71.1	76.5	81.0	84.2	87.9	91.1	98.2	98.8	101.5	110.2	119.2	128.2	131.5	143.8	153.5	173.6	165.8	180.3	182.1	175.8	168.4	**202.0**
Dealer (Trading)	43.9	47.5	50.2	53.3	58.3	62.4	63.7	67.7	72.8	76.9	79.7	82.9	85.5	89.5	91.1	93.0	102.1	110.1	115.3	119.6	131.8	138.1	155.3	147.3	161.1	158.9	157.1	151.9	**185.1**
End User (Non-Trading)	1.9	2.0	2.4	2.1	2.4	2.6	2.5	2.4	2.5	2.5	2.6	2.6	2.5	2.5	2.6	2.6	2.6	2.6	3.0	2.8	2.9	2.5	2.8	2.6	2.8	2.8	2.6	2.6	**2.3**
Credit Derivatives	0.4	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.9	2.3	3.1	4.1	5.1	5.8	5.5	6.6	7.9	9.0	11.1	12.9	15.4	15.9	16.4	16.6	16.1	15.9	**14.6**

Note: Numbers may not add due to rounding. Total derivative notionals are now reported after including credit derivatives, for which regulatory reporting does not differentiate between trading and non-trading.

Data Source: Call Reports.

(Source: http://www.occ.treas.gov/ftp/release/2009-72a.pdf US Office of Comptroller of the Currency).

The chart above demonstrates the picture of derivative growth in America while the table below summarises the position word-wide. (Source: ATCA 25 April 2009, original data source BIS). They include both listed and Over-the-Counter derivatives.

Derivative Description	Face Value US$ Trillions
Listed	542
Interest Rate Swaps	458
Credit Default Swaps	57
Foreign Exchange	62
Commodity	13
Equity Linked	10
Unallocated	81

Looking at the world as though it were a company one sees that we have a 'turnover' or GDP of $60 trillion backed by real estate assets of $65 trillion and financial assets of $70 trillion. On the liability side the total derivative exposure globally stands in excess of a Quadrillion dollars, not a number that many of us are used to using. This is before we take into account the layers of corporate, government and personal debt. In effect, the world is an investment bank whose assets are dwarfed by many multiples of gearing; and we all know what happened to investment banks.

THE CAPITALIST CONUNDRUM

Before the 2001 film A Beautiful Mind, few would have heard of mathematician and Economics Nobel Laureate John Forbes Nash. His ideology stemmed from Game Theory and the Prisoner's Dilemma, based on the assumption that people act in their own interest to get what they want. A state of equilibrium and stability is achieved through collective selfishness. When put into practice the human element was not accounted for; not surprising given Nash's severe psychiatric problems. Human beings are hard-wired to co-operate and act communally where conflict is the exception rather than the rule. The madness of the theory even extended into the theatre of war when the mechanics of death became mathematical. Body count targets were used in Vietnam rather than approaching the war with codes of patriotism or honour. The application of target-driven incentives led to the targets becoming a means unto an end as civilians were slaughtered to boost the body count.

Targets have also been at fault in both commerce and financial markets. The role of a company is to offer a product or service that is competitive and provides value for

money. As the company achieves volume and market share, the customers benefit and shareholders enjoy dividends and capital growth. When shareholders, staff and customer interests are aligned then a winning formula is achieved. Some investment houses specifically target those companies whose senior managers hold significant equity because they offer a competitive advantage for long-term investors. However, as is so often the case, good ideas can be hijacked or mutated by short-termism. The healthy approach of sharing risk and reward through equity has become deformed through share options; a case of the incentive turning destructive. They work well for new small companies that have no cash to burn on expensive staff but can offer rewards for the labour required to make them work in years to come.

However, the principle moved up the scale such that many large companies began to offer share option schemes. Share price targets were used as an incentive to align management with shareholders in a win-win situation. The reality meant that anything was done to cut corners on the product production or service offering while cutting costs and benefits for non-managerial staff. Behind the scenes accounting levers were pulled to massage earnings while loss-making elements were spun-off in special purpose vehicles, as was the case with Enron. Short-termism became the order of the day such that senior management could walk away millionaires in a short space of time. This was not entirely their fault given that many Board level positions for large companies have contract terms of little more than two years. The worst element was the result. Established companies with good brand names end up with a disillusioned staff, dissatisfied customers, huge gearing and shareholders losing value as earnings became diluted when options were exercised. It is no wonder that a minority of Americans are compounding their wealth while the majority stagnates. As the economic pie gets bigger, fewer people are taking bigger portions.

Like many historic episodes, the recent crash is a case of seemingly disparate events being drawn together simultaneously. In isolation each element is inert and stable but collectively they can start an explosive chain reaction. Under the auspices of Greenspan in 1990s, the bail-out mentality demanded that saving Wall Street was a pre-cursor to saving Main Street. Ben Bernanke is little better and was quoted as saying in Autumn 2008 that if the Fed did nothing after that failure of Lehman then there would be no economy the next week. This goes right to the heart of the mind-set of the banking fraternity who believe that they are the master and not the servant of the economy. Post 9/11 the banking system has come to resemble a production line of liabilities. The ascent of securitisation allowed banks to spin-off their debt, away from their balance sheets, leaving space to create yet more. Some hedge strategies revolve around borrowing at low rates, often in foreign currencies and investing in higher yielding assets, such as those provided in packaged mortgage products. The likes of Fannie Mae would take interest-only mortgages from banks and package them ready for sale to the secondary market. The so-called MBS or mortgage-backed securities could then be sliced and diced by hedge funds to create different tiers of risk and maturities for further re-sale. Assets that can generate steady returns are not confined to mortgages. Collateralised Debt Obligations or CDOs could package debts from credit cards, corporations and car

loan companies. These are yet another source of risk yet to fully unwind as consumer debt defaults are escalating.

The rapid expansion in securitisation stemmed from the voracious hunt for yield which was triggered by Greenspan's 1% interest rate episode in 2004 (coinciding suspiciously with an election year). Some bankers tried to blame President Clinton for promoting sub-prime lending and more widespread home ownership. Again, this is meant to be a feature of capitalism and banks can hardly claim to have been forced at knifepoint to chase risk. The rise of hedge funds also coincided with investor dissatisfaction with conventional mutual funds whose managers showed little flexibility to protect capital and had even less ability to do so through hedging. They were in any case capped with the percentage they could hold in cash, even if they wanted to be liquid. The same managers accuse hedge funds of selfishness but offer little alternative for capital preservation in a downturn. Managing a hedge fund is very hard work and an enormous mental challenge given the cost and complexity of hedging positions. Their performance on both the way down and the way up has been better than conventional investments. In the first 6 months of 2009 the average hedge fund returned over 5% while the S&P could barely muster 2%, in spite of Q2 being the best quarterly stock market rally in 20 years.

It is all-to-easy to demonise hedge fund managers and make them the bogeyman. They hold a spectrum of attitudes ranging from appalling arrogance to monk-like humility but are best judged on whether they practice what they preach. Superior managers share risk and reward with their investors and show great loyalty to their initial backers. The worst take big risks with other people's money and skim off the performance fees in the good times. Speaking as one who has managed portfolios for household names on Wall Street (placed in asset protection trusts to shelter assets from legal action in future) I can confirm that many do not buy what they sell, instead preferring to hold cash, bonds and gold for their own nest egg.

COMMODITY CRUNCH

While the focus of this paper is on the role of derivatives in the financial crisis, it must be viewed in the context of the real world. After all, it is the action of trading in esoteric instruments that has affected real prices for raw materials. This is a topic that is currently under investigation by the CFTC (Commodity Futures and Trading Commission). Up until 2002, commodities had become the forgotten asset class for most investment managers, particularly when the oil price had slumped after the Russian crisis in the late 1990s. Over the long-term, the price of real assets like commodities tends to move inversely compared with financial assets. The bull market in financial assets began in 1982 once interest rates had peaked (the same year that the gold rally ended spectacularly) and lasted roughly 25 years. As the economic cycle became dangerously stretched by debt, financials consequently formed the largest single sector as the market peaked, albeit at a lower proportion than technology stocks in their heyday. Real assets

such as gold and oil ground out their lows as equity Price Earnings ratios peaked then plunged between 1999 and 2001. Due to increasing efficiency and low input costs, commodity production and extraction was inexpensive. This was reflected in the shape of the futures curves whereby producers would accept lower prices for future delivery to guarantee demand. This left the curves in 'backwardation'. For futures traders it was a great time because buying a commodity futures contract would virtually guarantee a profit as the price rose to meet the higher spot price. It was rather like standing at the top of an escalator and waiting for someone to rise up to your level. This all changed when energy and commodity demand escalated with China becoming the workshop of the world. The fake prosperity induced post-9/11 through low rates and money production led to demand across the commodity complex.

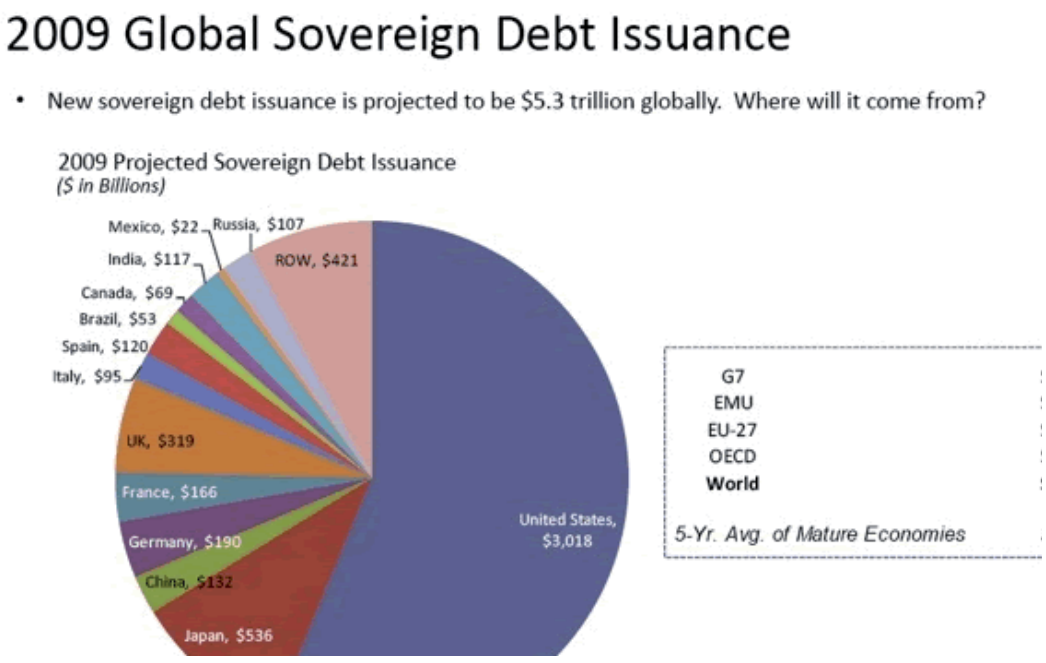
There was another impact from commodity futures curves elevating and going into 'contango'. As both demand and prices rallied this became a self-feeding spiral for momentum players and commodity funds. The number of commodity-based hedge funds began to flourish as prices soared. By the summer of 2008 speculative flows sent oil prices spiralling in spite of increased supply in the real world and full tankers with nowhere to go. The entry of ETFs (Exchange Traded Funds) added the proverbial fuel to the fire. Commodity prices in the form of food, energy and other utilities forms a disproportionate percentage of expenditure for the poor. There are positive aspects to higher energy prices in terms of lowering break-even hurdles for alternative energy sources. However, the sheer speed and scale of the rise did little more than feed speculative flows into related areas. There was not enough time to generate much-needed capital investment into real projects by the time the price collapsed. Long-term projects in alternative energy suffer from a lack of finance and are now of course in a worse position than before. It is now all-too-clear that distant speculative activity has an enormous and direct impact on both the developed and developing world. It further supports the Islamic approach of keeping assets and risks closely enmeshed otherwise prices and volatility spiral when they are detached from each other.

THE GREAT BOND BLOW-UP

Given the recent rally in equities it is tempting to assume that the worst is now over and to treat this paper as an historical exercise. We should be suspicious of the vested interests of those whose blind optimism sounds so attractive. The propagandists and media interests are in full flow, citing the equity market rally as proof positive. The same people who could not call the top of the market are now being relied on to call the bottom. Britain is a good case in point. In Q2 2009 the economy had officially shrunk 5.7% from its peak in April 2008. At this rate the economy will meet the official definition of a depression (a 10% contraction) although that is a very unfashionable term to use in this era of double-speak.

Investors and economists have a myopic view of inflation thinking mainly of supply and demand being the drivers. This is just part of the equation. When money is being

diluted it more of that currency is required to buy the same amount of material (=higher prices). The difference between modernity and the Middle Ages was that it used to be possible to tell when money was being debased. This was because coin quality deteriorated and one could physically weigh and feel the difference. Nowadays we have little sense of the dilution effect partly because bank-based credit is intangible but worse still you cannot find the numbers. To supposedly save on costs, the M3 money supply figure ceased to be produced in 2005 in the USA. Given the profligacy so prevalent at every level of government spending, this apparent economy measure appeared all the more mysterious. Money supply is the thermometer of monetary growth which directly affects true inflation. Like unemployment data, official inflation numbers are replete with distortions to make them appear understated and bear little resemblance to the ever-rising cost of living experienced by the public. It is not just a case of mass producing money to float a sinking, debt-ridden economy. In the short-term even quantitative easing this has been a failure given that every $100 spent on stimulus has led to a counter-productive saving by consumers of $102. Likewise, at a time when the balance sheet of the Federal Reserve and other central banks has doubled, the M1 money supply has shown a paltry rise of 14%.



Source: Hayman

Meanwhile a wave of bond issues is set to suck the capital out of markets and push up long-term interest rates (see chart above from Jon Maudlin's July 2009 report 'Does 5 Trillion of New Debt Mean End of the Recession'). Maudlin's conclusion is that there is simply not enough capital to fund forthcoming debt issuance of over $5 trillion equating to 9% of world GDP. This is for 2009 alone. Every path has a negative consequence for the economy, be it greater household saving, reduced borrowing or higher rates to attract foreign capital (which equals higher mortgage costs for consumers). The

US alone has to issue $3 trillion of debt once TARP-related funding and Municipal requirements are taken into account. The Great Depression is a useful role model. After a strong year in response to the 1929 Crash, bond prices then went on to fall decisively as infrastructure-related issuance swamped the market.

This all adds up to bad news for bonds, the dollar and for markets in general. Smart investors would be wise to look at gold once more, which performed well throughout the Depression. Equities experienced seven bear market rallies in that period. This is where prices surge but go on to drop below their starting point in a downward zigzag pattern. Although many are quick to argue that current times are not comparable it is nonetheless revealing to witness how the optimists were beaten down time and again. Maybe this time it's different (that's what they always say) but while technology may have been improved there is little to suggest that human nature is any different than it was 80 years ago. These are, after all, the driving forces of markets which is why they are so hard to model scientifically.

CREDIT DEFAULT CRUNCH

Of more concern is the scale of the speculative activity in the background of bond markets. Congresswoman Waters is pushing for an outright ban of the likes of credit derivatives and one can sympathise with her view. However, the legislation is likely to steer more toward a ban on naked swaps where trading is not for hedging purposes. As ever the propagandists cite higher cost of funding as they always do to justify themselves and protect their speculative activities. As operators in an unreal world they always use the real world as an excuse for their self-interest. The fact is, end-users in industry are negligible players. Given that the credit derivatives market is unregulated in the first place a ban may be the only way of avoiding an escalation of future crises. There is a good deal of comment about bringing Credit Default Swaps (CDS) onto an exchange rather than operating Over-the-Counter (OTC) as private deals between banks. CDS dealers have made a smart move by setting up their own ICE Trust or what they call a centralised clearing house. However, this is not a clearing house in the true sense which is independently capitalised. The margin requirements, not surprisingly, are undemanding. Bringing such instruments onto a proper exchange would indeed reduce counterparty risk, bring greater transparency and improve pricing. The example of commodity futures trading is often cited as being an orderly market for that reason. Orderly or not, the exchange trading of oil futures could not prevent a speculative surge and slump in price. As ever, the onion skin must be peeled back to answer the question as to whether an activity is truly beneficial for the end-user and for society as a whole.

A classic argument is made that they are a zero sum game and are portrayed as a big boy's game where potential losses are taken on the chin and are just a fraction of the notional value. If this is the case then why were the public forced to bail out AIG? In September 2008 the government had little option but to provide an $85 billion loan

in return for an 80% equity stake with the final figure amounting to $180 billion. Like all assumptions that formulate a model, they function until they don't, just as they did for clever quant hedge funds. Insurance works while counterparties are a going concern but breaks down upon bankruptcy or when looking for legal means to avoid liabilities. The time when you need insurance is in exactly such a scenario. It makes one wonder what will happen when a serious bond bear market gets underway, as it did in the early 1930s.

Bond supply beckons from developed and developing countries and of course corporations across a whole spectrum of quality ratings. This is when long-term interest rates will soar and of course bond prices fall. Defaults and bankruptcies will inevitably follow rising funding costs. It will be interesting to see who is going to be paying up for this bond insurance when credit derivatives are called on to provide what counterparties paid for. While large banks are the major players in CDS contracts there are no doubt smaller entities who thought that writing insurance was easy. A lesson from the Lloyds Insurance fiasco of the 1990s was that the very syndicates that wanted to take on the risk and grab the commission were exactly the ones who did not have the capital base to support such speculative activity. Dr. Sami Suwailem points out those parties most willing to assume more risk are not necessarily the ones who ought to be taking them on. Derivatives allow such transfers to take place and accumulate. This problem is not going away and as recently as Q2 2009, France's Société Générale took a substantial hit from Credit Default Swaps. Some €1.3 billion were lost in hedging its bond portfolio. It is not entirely clear how so much money was lost if the positions were properly hedged.

It is worth looking at the mechanics of CDS contracts. When writing the insurance you will receive a small percentage of the assets at risk much like an insurance company takes in premium. By assessing the likelihood and scale of any potential loss, the figure is deducted from the 'premium' and the net profit is booked. However, in order to win the bid, the quote for can be massaged lower by making small changes in assumptions. It is rather like adjusting the data inputs on a dividend discount model and getting significantly different valuations for a stock price. It is little wonder that the likes of Goldman Sachs underwent such wild swings in earnings given that some $13 billion of CDS contracts were written between Goldman's and AIG. The government bail-out was a God-send for them. It highlights the risks that are still inherent with the CDS market and it assumptions. When a counterparty fails to honour a contract, either through bankruptcy or legal dispute, it can set off a chain of unintended events and unexpected consequences. A domino-effect of liquidations would ensue where risks assumed to be hedged prove to be fully exposed.

Given the empirical concern with the sustainability of high rates of growth in any trend or item, credit derivatives surely beat the lot. Between 2004 and 2008 inclusive these contracts (predominantly credit default swaps) grew at a compound rate of 100% per annum. However Q1 2009 has not surprisingly seen a curtailment of 8%. There are those such as financial journalist Tony Jackson (Financial Times 20 July 2009)

who believe that large notional numbers are not to be feared in their own right. He highlighted three problems, namely their pricing, speculative rationale and their size relative to the underlying bonds they represent. His response was that derivatives markets are often far bigger than the underlying assets they represent and that as an immature market pricing is opaque. He recommended that such contracts be traded with higher capital requirements and be placed through a user-owned exchange for greater standardisation and transparency, which is normal for other derivatives. This would reduce the dominance of the big 5 banks in this market. His points are well made but the bottom line is that these are reforms for a market that is fundamentally speculative. After all, it's hardly the same as a farmer hedging his harvest risk through corn futures.

Of all derivative exposure in the top 25 US banks, the lion's share (61%) is concentrated in interest rate swaps (IRS) rather than credit default swaps (CDS). This yet another concern because these rate swaps create an embedded and artificial demand for US government bonds (Rob Kirby 'The Elephant in the Room, 19 April 2008). IRS in excess of 3 year's duration are usually hedged with US Treasuries thereby leading to substantial bond purchases that would otherwise not exist. This is disturbing because it may well mean that bond yields are much lower than they should be. Any market that is artificially constrained is asking for trouble because small, unexpected changes can unleash substantial price or yield moves. Coupled with the oversupply glut which is coming in any case we may be on the verge of a spectacular bear market for bonds, in spite of a worsening economic scenario.

Kirby's calculations for JP Morgan's derivative exposure (using Q3 2007 as a worked example) show that over $40 billion bonds per day are required simply to hedge the growth in their swap book. He calculated that their daily theoretical demand was greater than the availability of the domestic bond market for the entire Quarter. The conclusion was that their IRS book is not hedged, even when 'netting' effects are taken into account. This goes back to human failing of extrapolating a positive outlook and under-assuming the negative outcome.

Top 5 US banks asset and derivative exposure (Source OCC Quarterly Report Q1 2009)

Bank Holding Company	Total Assets (US$ Trillion)	Total Derivatives ($ Trillion)
JP Morgan Chase	2.08	81.1
Bank of America	2.32	77.8
Goldman Sachs	0.93	47.8
Morgan Stanley	0.63	39.1
Citigroup	1.8	31.7

The sheer scale of overall derivative exposure in the top 25 banks dwarfs the puny size of assets that support such positions. The OCC report for Q1 2009 shows a ratio of total assets of roughly $13 trillion versus $291 trillion in total derivative exposure. While notional values appear frightening, they are usually hedged to some degree and there are reserves set aside for at least a portion of the expected losses. Whether these hedges will work when the bond markets undergo an inevitable period of distress is yet to be seen. While a good deal of focus has been on the subprime market it is important to realise that the mainstream credit derivative market is at least 50 times that of sub-prime derivatives. Of further concern is the lack of transparency. As highlighted by Rob Kirby, the OCC reports show a good deal of data where derivative exposure is concerned for what are now commercial banks. However detail is more opaque at the Holding Company level where, for example, positions in precious metal derivatives are not properly recorded. Major players in the metal markets are shown as having zero exposure. The so-what of this focus on CDS and IRS is that the mainstream bond market is likely to be the next big crisis which would dwarf what has happened in equities.

CORRELATION, COMPLEXITY AND COMPLIANCE

In the aftermath of any financial fall-out there is a knee-jerk response for ever-greater regulation rather than digging deep to find the true cause. The problem with adding yet more layers of regulation is that when you are dealing with cunning people, they can run rings round the rules. Finding loopholes and short-cuts is the essence of their being. Regulators are usually reactive in legislating for past problems that they failed to foresee in the first place and are rarely proactive in blocking the next step in speculation. Prescriptive regulation is incredibly burdensome, bureaucratic and complex and paradoxically is part of the problem. This was highlighted by author and risk manager Richard Bookstaber who coincidentally helped to design portfolio insurance trading, often cited as a contributing factor of the 1987 crash. His curiosity was aroused when he realised that over the space of the last 50 years financial crises were becoming more frequent and that the S&P 500 was becoming more volatile; yet economic GDP variation had halved over the same period.

His conclusion was that a combination of two factors lies the root of any systemic failure; tight coupling and complexity. In the case of finance this should be amended to correlation, complexity and compliance. If the latter are the ingredients of dynamite then the detonator is flexibility, or a lack of it. Complicated systems can function far better if there is slack in the system, be it in terms of time or organisational factors. Due to technological advances the time element is no longer an option, other than shutting markets down on a more regular basis. Tight coupling has come about because of the high correlation of asset prices; in turn caused by excessive leverage. As prices fall good securities are sold with the bad to meet margin requirements and investor redemptions. Markets form a vortex with no escape, rather like climbers attached to a poorly secured piece of rope. Even safe-haven assets like gold struggled in 2008 in what should have

been a perfect scenario for its appreciation. This is how detractors of Islamic Finance try to undermine its tenets. The very people who caused widespread instability say that Islamic Finance is not a viable alternative because it uses real assets; the same assets they caused to be unstable through gearing.

The second highlighted danger was that of complexity. The great paradox of complicated financial products is that they fail through over-simplistic assumptions which were discussed earlier. One cure of the conundrum is to reduce the speed and volume of transactions which is done partly by reigning-in leverage. This is a conflict for the capitalist ideal because the volume, speed and leverage are all components of profitability. This is another disturbing aspect because automated trading is ramping up across exchanges to the disadvantage of long-term holders of stock i.e. retail and pension fund investors. The NYSE announced on 24 June 2009 that it is to end its practice of requiring the reporting of programme trading in a move that would appear to protect the ex-investment banks. In a world supposedly moving to greater transparency this seems to be a particularly opaque action. This could be yet another case of banks trading on their own behalf for their own benefit at the expense of their customers which sounds like nothing has changed.

It is not just the complexity of products that has contributed to the crash but that of their regulation. Time and again we see examples of industrial accidents and disasters, including nuclear reactor meltdowns, caused by too many procedures, systems and warnings. Worse still, when there was still time to stop them, the risk reduction measures put in place confused and exacerbated the breakdown. This goes to the heart of the regulatory conundrum. You can never get rid of a minority of crooks who will never obey rules in the first place but in the process of trying to squeeze them out the entire financial system becomes more dangerous and destabilised. In other words, the pursuit of the minority punishes the majority with little measurable benefit. The people who obey the rules are the ones who are burdened by them. Layers of regulation act like over-stimuli which deaden sensory perception such that they cease to function or head the warning. This is particularly the case when procedures written by lawyers and non-practitioners make no sense and become a tick-box exercise. The procedures become processed for their own sake and lose their logic and original purpose.

Hastily prepared laws and knee-jerk legislation can also potentially devious and destructive on a local and national scale. There have been many examples where governments have abused laws created for one thing and used for another. So-called anti-terrorist legislation has been exploited for unrelated extraditions and for straightforward tax collection. In a highly damaging incident, Britain's Gordon Brown used just such legislation to freeze the assets of the Icelandic government to protect British depositors; an act that will repercussions for years to come. Like all protectionist behaviour it is popular at home but highly damaging for international relations and ultimately self-defeating in the long term. It was of course the same mind-set that led to such damaging and selfish trade tariffs in the 1930s, further exacerbating the Great Depression and raising tensions in the build-up to World War II. When too many

procedures and rules are created the good intentions of risk management turn in on themselves such that internal procedures became a greater risk than the rare exogenous shocks they are designed to prevent. Either way, self-regulation and imposed regulation have done little to curb banking excess.

SOROS' SUGGESTIONS

Writing in the Financial Times (17 June 2009) legendary hedge fund manager George Soros believes that regulation of derivatives and trading through exchanges is not the whole story. Having gone too far in deregulating there is a danger of going too far the other way. He argues that regulators must take responsibility for preventing asset price bubbles. Alan Greenspan was conspicuously keen to avoid such a responsibility which is no great surprise given his role in multiple bail-outs and subsequent bubbles. Soros also states that credit as well as money supply must be controlled, not that there was ever much of evidence of the former. He suggests active rather than static margin plus minimum capital requirements. Regulators should also not ignore imbalances where too many trades are on one side of the equation. A good example of this occurred with LTCM. They provided liquidity to the market and distorted the market by their presence. It is reminiscent of the Heisenberg principle that the observation process itself risks affecting the results. The rationale for their process was based on historical models which they changed by their very dominance and presence in the market.

Soros also suggests that compensation arrangements for bank proprietary trading be regulated to align risk and reward. One possible idea is to pay bonuses inversely related to the institution's gearing. In other words, the greater the gearing the less the proportion of the bonus pool becomes payable. This would automatically promote skill and timing over leverage but does not get away from the fact that the institution is getting rewarded for destabilising markets. He believes that bringing trading onto exchanges is not enough although it is a start given that you can only act on risks you can effectively measure. Non-standard, custom-made derivatives are engines of profitability for the people who write them; not the customer. Once again complexity is used as a veil of secrecy designed to deceive the investor. A very good example of the misuse of derivatives comes with CDS in the case of General Motors. When some bond holders with large CDS holdings stood to gain more from bankruptcy than survival then this is the ultimate mutation. In the wake of a short-selling investigation after the Great Crash of 1929, newspapers coined the phrase 'Don't sell America short'. While bad companies, like bad banks, should go bankrupt, there is no need to actively force it.

One reason why hedge funds are so focused on annual bonuses is that they are difficult to sell as a going concern. Hedge funds monetise performance as the business cannot be scaled and may be limited on the size of assets they can take before crushing their specialist market niche. In effect they are too specific and there is too much human capital which probably explains why listed hedge funds have conservative P/E ratios. Their very nature makes them short-term and in practice the managers cannot sustain

long-term performance, as highlighted by Dr Sami Suwailem. Another point he makes is that derivatives increase instability and contagion rather than simply spreading them round and smoothing the overall impact. Like some hedge fund activity, anything that is short-term and unsustainable is likely to do long-term and sustainable damage. This happens in farming when the earth is ruined and turned into dust bowls by a lack of stewardship for the land.

There is a further element of financial markets that make them more risk-prone than other business activities and that is liquidity. Mark-to-market accounting means that assets become valued on their current liquidation price which is clearly not the case for other industries were plant or materials may take months to sell. In times of distress, financial assets are marked down excessively and far more quickly than other assets. This fire-sale approach means that mark-to-market losses are more severe than reality. For example, US mortgage-backed losses are expected to be around $100 billion less than accounting assumptions would indicate, as highlighted by Professor Myddleton of the Cranfield School of Management. By marking prices down too aggressively on such securities banks deleverage elsewhere and loans are called in for unrelated areas and lending activities freeze.

PHARISEES AND CAMELS

The Pharisees were the wealthy government officials and legal bureaucrats of their day who were adversaries to the Prophet Jesus (pbuh). They were characteristically observant of details of law but lacked mercy. They saw him as a threat to their power and privilege, especially when Jesus was compassionate to the poor. He harshly rebuked the Pharisees at the Temple of Jerusalem using the phrase 'Ye blind guides that strain out the gnat and swallow a camel'. In other words, the legally-minded type of person will pursue detail to the finest degree but miss some of the most obvious and important elements that they either cannot control or do not care about. In the pursuit of detail they actually undermine the law itself by making it unworkable. Worse still, the Pharisees' approach placed huge and unaffordable burdens on the poor who could never hope to meet the obligations. As the old saying goes, the road to hell is paved with good intentions.

The election of the Labour Party in Britain with lawyer Tony Blair at its head lead to an unprecedented wave of legislation with a record number of statutes added to the books. The paradox is that crime has been rising ever since which is good evidence that laws are no substitute for morality and that codification cannot beat common sense. There are many parallels here with the target-driven system whose selfish pursuit actually worsens the service offering and has many damaging knock-on effects. Laws created to protect those who are vulnerable and in need of protection end up doing the opposite. Like the Pharisees of old, modern legislators attempt to cover all contingencies and procedures to the nth degree. The safety belt becomes straightjacket and in the case of finance leads to a counter-industry of tax and legal advisers that look for loopholes.

One of the obvious consequences is that when wealthy individuals, hedge funds and corporations alike become constrained unnecessarily by red tape and tax they simply move themselves or their operations elsewhere. This has serious effects on the tax base and unfairly burdens the poor. Wealthy people and successful companies do not mind paying fair taxes, spent by governments that provide efficient services and value for money. When governments adopt the same self-destructive target systems that worsen crime rates and public services, then it is no wonder that the people who pay the most tax feel disgruntled. Increasing tax rates have a negative effect on tax collection and should not be viewed as a badge of honour by socialist regimes. This was amply demonstrated when Britain's ex-Prime Minister Margaret Thatcher cut the highest rates of tax substantially but ended up collecting more tax revenue. This is known as the Laffer curve effect named after Arthur Laffer who in turn attributed the concept to a Muslim scholar from the Middle Ages (Ibn Khaldun).

Taxation has also played its part because interest is treated as a deductible expense, giving an incentive for debt over equity. This also encourages speculation because good things that generate income, like work and dividends from equity investment are punished. However, speculative activity that uses gearing and generates capital growth is treated more favourably, especially if you are a running a private equity investment company in the UK. Time and again in the so-called boom years, conservative companies that generated taxable profits were subject to private equity buy-outs. The debt that was then dumped on the target in some cases eradicated profits altogether and made the structure far more unstable in the crash that was to follow. When Britain's Shadow Chancellor George Osborne recommended that interest cease to be a deductible in July 2009 he was rounded on by business groups. They did not understand his commendable rationale as business leaders misinterpreted the move as a tax saving device and another nail in the coffin for corporations. In the banking sector, tax distortions are contrary to prudence and penalise the accumulation of capital reserves. It also encouraged the use of debt-based instruments in tier one capital.

It is easy to be cynical and highlight the fact that many senior regulators, Treasury officials and political advisers are made up of old boys from investment banks, especially in America. One could argue that they are wolves in sheep's clothing and that they lack an incentive to tackle the real cause of the crisis in financial markets. A kinder interpretation would be that many are simply overly legalistic in their approach because that is their background. It is no wonder that the British Treasury, Bank of England and the Financial Services Authority were accused of paralysis during the bank run at Northern Rock. They are merchants of fine detail (the gnat) and ignore the big, guilty secret that lies at the heart of banking (the inconvenient camel). The secret, now exposed, is that banking is not about matching lenders and borrowers in a beneficial intermediary role. It is about creating money from nothing and steadily growing through the compound effect of interest on interest. What is profitable for the banking sector is ultimately inflationary and damaging to the long-term health of the financial and economic system. Speculation is not a service industry and is not about being paid to act as an agent for two parties. Finance was once the lubricant in the engine

of commerce or servant to the master. The financial markets appear to be decoupling from the wider economy in their activities and becoming self-serving, unless of course a bail-out is required. This is where the 'private profit, public loss' phrase is appropriate. Speculators are skilled operators in trading and the idea that they make money from each other in a zero sum game is deceptive. As highlighted by Dr Suwailem, they make money not from each other but from government intervention thereby worsening the risk of moral hazard. The so-called 'Greenspan put' was a fitting metaphor after all he was writing the put and taking the speculative risk with the public's money to help out Wall Street.

Banks demand the facility to hedge because of their misalignment of assets and liabilities. What we can now see is that the instruments used to hedge have instead been abused to worsen the imbalance. Paradoxically, the credit crisis has concentrated risk in the banking system. The current mantra is that we must not be blackmailed by big banks that hold the economy hostage with the threat that they are 'too big to fail'. As highlighted by the July 2009 report by Bedlam Asset Management in London, the largest banks have an even greater share of GDP than this time last year. Credit is shrinking and small banks are being taken over by larger counterparts. EU Competition Commissioner Neelie Kroess has called for a break-up of government owned entities in the UK but lobbyists will no doubt de-rail the intercession.

Talk of creation of a 'super-regulator' or disbanding the likes of the FSA miss the point and may be little more than shuffling the deckchairs on the Titanic. The same people who will be paid off on losing their jobs will be re-hired the next day for want of suitably qualified personnel. Regulation that failed in the first place is hardly going to improve by seating the same people in a bigger building. The suggestion of passing responsibility back to the Bank of England likewise ignores history. It was the collapse of the fraudulent BCCI bank that led to the Bank of England being stripped of its powers in favour of the SIB (Securities and Investments Board). If past experience is anything to go by, regulation is a growth industry that follows the Parkinson's Law principle of ever-increasing numbers of bureaucrats. The reform proposals from Sir David Walker are typical of ex-banker regulators who try to fix a failed system in the least controversial manner rather than scrapping it altogether. In any case you cannot legislate for unethical behaviour because the greatest conflict of interest can never be covered by legislation and regulation. How can it be that one part of Goldman Sachs was issuing sub-prime bonds while another was shorting the same market? This goes to the very essence of the capitalist tenet; the combination of individual and corporate self-interest is supposed to create a beneficial spin-off or equilibrium for the economy. This has clearly not happened and will never change until the real culprit of credit creation is stifled; the same deceptive approach that led goldsmiths to issue notes in excess of their gold holdings in the first place.

Businesses should indeed have competition and less regulation but the market, like trade itself, has become distorted by banking. Banks should be allowed to go bust and not be bailed out; after all, this is what they do to their borrowers who cannot pay back

their interest and capital. These are the aspects of real business that bring true risk and reward into the equation and ironically make the economy and market a safer place. Why? Because bad lenders are punished as risk acts as a natural feedback mechanism to prevent asset price inflation. When you commoditise and spin-off risk you invite the very bubbles that create much greater risks. The simple prescriptive approach of Islam would counter these problems because they are black and white rules that stop the rot at inception. They do not tell you the number of recommended units of alcohol for different categories of males, females, age groups and body type; they say no alcohol. It's not about Basel regulations or tiers of capital; it is about avoiding interest and speculation. How much easier and simpler is that approach? Of course there are huge vested interests against breaking the monopoly of money creation and speculation but vested interests do not represent the majority of the population. According to a report on ABC News (26 September 2008) Goldman Sachs spent $43 million on lobbying and contributing to political campaigns since 1989. It would be interesting to see what their charitable donations were over the same period.

CONCLUSION

Derivatives and leverage have played a significant role in heightening the speed, complexity and correlation of asset prices, thereby destabilising financial markets and the real economy in turn. The ability to hedge has exacerbated systemic risk and risk-taking, based on models whose flaws were recognised by their designers from the outset. Further regulation will add to market instability and overlooks the core of the problem which is private credit creation with an interest rate attached. Bail-outs will leave consumers indebted for decades to come and have perversely concentrated the number of banks. Debt and derivatives have drawn capital away from real and beneficial activities and into instruments that are esoteric and destructive. Islamic principles are the only solution to the weakness of human beings that seek to make money from money without hard work. It is now clear that risk and reward are the yin and yang of financial markets that should exist side by side. Together in balance and proportion they make a perfect whole but when separated cause chaos and inequity.

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The role of derivatives in the credit crisis

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ABSTRACT

The paper deals with the role of derivatives in the global financial crisis. We argue that the unprecedented growth of derivatives of all kinds – mainly Credit Default Swaps, and the leverage that they imply have greatly contributed to the depth and proliferation of the financial crisis, and the transformation of the whole financial industry. The solutions proposed include the establishing of central clearing houses to diminish counterparty risk, change the regulation to induce the use of derivatives as hedging tools to reduce, not to enhance risk, tackle the compensation system of the of the financial institutions to limit bank leverage, alter the governance of rating agencies and improve derivatives accounting.

Introduction

During 2001-2007, a strong debate was held on the role on derivatives in the financial markets and in the economy. Warren Buffet famously claimed that credit derivatives were "weapons of mass destruction". Alan Greenspan's view was that credit derivatives were excellent tools to spread risk, facilitating the access of many people and businesses into credit. Alan Greenspan stated in a speech in 2004 that derivatives and other complex financial instruments have contributed "to the development of a far more flexible, efficient, and hence resilient financial system than existed just a quarter-century ago." He further stated in the same speech that "the new instruments of risk dispersion have enabled the largest and most sophisticated banks in their credit-granting role to divest themselves of much credit risk by passing it to institutions with far less leverage". (1)

By the summer of 2009, this debate seems to be over. Warren Buffet was right, Alan Greenspan, wrong. Yet, which are the specific financial and macroeconomic mechanisms by which derivatives have contributed to enhance the impact of the credit crisis? On the other hand, another question arises: have all derivative contracts been guilty on the crisis in the same magnitude? And, more importantly, can we establish some guidelines within the derivative markets in order to prevent these instruments to amplify future financial crisis?

In this paper we will be addressing these questions.

Section 1 will be looking at the intimate relations that exist between derivatives and economics, explaining how the increased use of derivatives was a determinant factor in expanding the monetary base, a synonym of credit growth, hence laying the foundations for an excessive leverage and its resulting asset price inflation that clearly contributed to the crisis by generating systemic risk.

Section 2 addresses every major derivative market's role in the credit crisis: credit default swaps (CDS), other non equity over the counter (OTC) derivatives, commodities' derivatives and equity linked derivatives.

Section 3 will explore some key recommendation for policy actors and bankers in order to prevent derivatives from becoming systemic risk enhancers in the future.

Lastly, in Section 4 we introduce our main conclusions.

Before we proceed, we define hereafter the main derivative contracts we will be writing about in this paper:

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١ Speech by Alan Greenspan on World Finance and Risk Management at Lancaster House, 25 September 2002

CDS is a type of insurance against counterparty's going bankrupt. Thus, if you hold bonds issued by Telefónica and you want to protect yourself against the possible risk of its bankruptcy, you could buy a CDS. This would mean that if Telefónica were to go into liquidation, although you would lose the value of your bond you would recoup your money through the CDS you have taken out. A CDS can also be used as a bet on a company's bankruptcy or survival. So, if in early 2008 you thought that Lehman Brothers could go bankrupt, you would just need to buy a CDS. The price of the insurance would rise as the likelihood of Lehman's bankruptcy increased, and vice versa.

A CDO (Collateralized debt obligation) is a synthetic security that is asset backed. Its value and the payments depend on the fixed income securities that are used as underlying assets. For instance a CDO can be created from a certain amount of mortgages that a bank has in its balance sheet, which are "pooled" together and later on "sliced" to be sold as different parts or tranches. Those tranches are supposed to have different risk profiles, depending on their seniority. CDO squared are simply CDOs created by "pooling" different tranches and/or types of other CDOs.

Synthetic CDOs can be built by building an investment vehicle which sells protection on different companies, by shorting CDS contracts. This strategy yields very attractive returns, at the expense of high risk if credit conditions worsen.

Colletarized loan obligations (CLOs) are CDOs with their main assets being loans, not bonds. These loans tend to come from companies acquired by the private equity industry, which are normally highly leveraged. The loans, provided by investment banks, are then packaged and sold between investors in the same way as CDOs.

Both CDS and CDO are over-the-counter (OTC) derivatives, that is to say, contracts that are traded (and privately negotiated) directly between two parties, without going through an exchange or other intermediary. Some products like swaps, forwards, exotic options are almost entirely traded over-the-counter.

Exchange-traded derivatives (ETD) are those derivatives products that are traded via specialized derivatives exchanges or other exchanges. Flow equity derivatives, such as short term futures, call and put options on indexes or stocks tend to be ETD.

ETFs are open-ended mutual funds that are mostly passively managed. They give an investor all the diversification of an index with the simplicity of holding a share. Normally ETF use derivatives (mainly futures) to buy the stocks or indexes they are supposed to replicate. ETF are traded continuously on several exchanges with dedicated market makers providing guaranteed spreads and sizes around the NAV

According to the Bank for International Settlements, within an approximate total value of OTC derivatives of USD 600 bn. at the end of 2008, the vast majority of OTC contracts were interest rate and foreign exchange derivatives, with notional values of circa USD 470 bn. There were more than USD 40 bn. in CDS contracts; OTC equity

linked represented amounts above USD 6 bn., and commodity derivatives slightly below USD 4 bn. As for ETD, options amounted to less than USD 40 bn., with futures being close to USD 20 bn., the rest being options.

Section 1

> Many people argue that derivatives reduce systemic problems, in that participants who can't bear certain risks are able to transfer them to stronger hands. These people believe that derivatives act to stabilize the economy, facilitate trade, and eliminate bumps for individual participants.
>
> On a micro level, what they say is often true. I believe, however, that the macro picture is dangerous and getting more so. Large amounts of risk, particularly credit risk, have become concentrated in the hands of relatively few derivatives dealers, who in addition trade extensively with one other. The troubles of one could quickly infect the others. On top of that, these dealers are owed huge amounts by non-dealer counter-parties. Some of these counter-parties are linked in ways that could cause them to run into a problem because of a single event, such as the implosion of the telecom industry. Linkage, when it suddenly surfaces, can trigger serious systemic problems.
>
> In our view, however, derivatives are financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal.

--Warren Buffet, letter to the shareholders of Berkshire Hathaway, 2002

These words were written five years before the credit crisis erupted. Indeed, the collapse of Long Term Capital Management in 1998, driven by the excessive leverage it employed through derivatives prompted the FED to organize a rescue, since these derivative positions had produced a level of systemic risk that made bankruptcy a much worse option than an organized rescue such as the Fed orchestrated after the collapse.

If risks had been so clearly identified as early as 1998 and 2002, why policy makers refused to take actions to prevent the systemic risks that the growth of derivatives was bringing? Behavioural finance has a lot to say in this answer, as incentive mechanisms prevented traders, bankers, regulators and politicians from acting when it was still possible to do so.

Despite his statements, even Warren Buffet entered into derivatives market. Berkshire as of March 31, 2009 had USD 13.85 billion of paper losses on derivatives, according to Reuters[(2)]. For the first three months of 2009, the operating earnings of the company, which exclude investment and derivatives gains and losses, were USD 1,705 bn. This means that by the end of March 2008, Berkshire Hathaway faced a loss from its

2 Reuters, May 8, 2009

derivatives contracts that wiped out the operating earnings for the two previous years. However, Mr. Buffett stated that those derivatives are used for hedging and would be held to maturity.

Fitch estimates that in July 2009, five firms hold 80% of derivatives risk and 96% of credit derivatives:

> About 80% of the derivative assets and liabilities carried on the balance sheets of 100 companies reviewed by Fitch were held by five banks: JP Morgan Chase, Bank of America, Goldman Sachs, Citigroup, and Morgan Stanley. Those five banks also account for more than 96% of the companies' exposure to credit derivatives.[3]

This tell us how vastly concentrated is the modern financial world. Those financial institutions are a systemic risk that was waiting to happen and hold the modern financial system a hostage. If one of these five firms fails, that would create a perfect storm that could cause the meltdown of the modern financial system, something which leads to moral hazard and even greater accumulation of risk among these five firms.

These figures illustrate how derivatives have contributed to introduce systemic instability to global macroeconomics: on one hand derivatives are a rapid way to create liquidity; this liquidity contributed to increase the inflation of every asset class: equities, bonds, housing, and commodities; on the other it has generated a systemic risk concentrated in the hands of only a few financial institutions.

Derivatives allow the spreading of risk and provide access to liquidity to virtually everyone, not just professional investors. As mortgages are being packaged and distributed to investors, then liquidity is made available to a single house purchaser. As derivatives allow the securitization of credit card loans, of student loans, of car loans… then liquidity is also available to virtually every consumer, and as that risk is being packaged and sold to international investors, theoretically the benefits of risk diversification allowed for more liquidity to become available for these consumers. This phenomenon reached its peak in the 2001-2007 years, exactly the years in which world trade was increasing with the integration of China, the ASEAN and former Soviet States into the international trade flows. This allowed the access of goods manufactured by lower paid workers based in these countries to Western consumers, generating a downward pressure in consumer prices that kept official inflation rates from rising to levels which could become worrisome to central bankers. This scenario of high growth low inflation was defined as "goldilocks", and it prevented the Fed or the ECB from pursuing a more aggressive monetary policy by raising rates during the 2004-2005 period.

3 David M. Katz - CFO.com, July 24, 2009

However, the key question to address on the impact on derivatives on macroeconomics stay on how derivatives contributed to exacerbate asset price inflation. Derivatives, through Colletarised Debt Obligations (CDO) allowed many Americans the possibility to buy and own houses at affordable prices. This possibility was open to every social class. Lower class Americans obtained financing through subprime mortgages, which risks, pooled and sold, were tranched in different pools of risks according to investors' appetite, so that the riskiest tranche would bear the first losses on the investment if the mortgages were not paid back. This scheme worked under two assumptions: i) house prices do not come down, and ii) house prices in different US states are uncorrelated. Middle class Americans obtained financing from the two Government Sponsored Entities, (GSE), Fannie Mae and Freddie Mac, and those entities packaged these mortgages into bonds with derivatives embedded and sold them to international investors. Higher class Americans obtained mortgages through jumbo loans which were also sold to institutional investors using derivatives. Those Americans who were not willing to offer information on their personal details did obtain financing through "Alternative A" mortgages, which were also packaged and sold using derivatives. The result of this huge level of liquidity being available though derivatives to finance house purchases was real estate inflation. As houses were used as collateral for the payment of the mortgages, once house prices became inflated, financial stability was threatened.

On the other hand derivatives allowed both Hedge Funds and Private Equity to obtain huge levels of liquidity. Hedge Funds play investment views through derivatives, and much of the financing they obtain (they tend to use a leverage ratio of 3-4 units of debt per unit of equity) is normally obtained through the prime brokerage division of a major investment bank, institution which also facilitates the trading and clearing of the derivatives the hedge fund enters into. As for Private Equity, this industry normally acquires businesses and changes the capital structure of the target firms by employing very high levels of leverage, debt to EBIDTA ratios above 5 and 6 times were common before the crisis. Investment banks would provide the financing for these acquisitions, and would soon package these loans into CLOs, which were then sold into institutional investors. Such was the need to win market share within private equity that many of these loans were "convenant lite", ie. very limited restrictions were placed upon the company's financials (leverage ratios) to keep the loan from being called back. This liquidity helped the private equity industry to accomplish the largest leveraged buy outs in history, generating very dangerous levels of leverage in some companies, as we saw with the case of Chrysler. This behaviour increased systemic risk, both at a company level and at a banking level.

Soon, the liquidity facilitated by derivatives also traduced into other asset price inflations. Equities had their run from 2003 to 2006. Exchange traded funds (ETF) allowed retail investors to trade stocks and indexes they were not trading before, as ETFs could use derivatives (mainly futures) to invest in the stocks of the indexes they were representing. Furthermore, through the use of warrants, retail and institutional investors could lever up their bets in stocks many times by buying call options or selling

put options if they thought the prices would move up, or by buying put options or selling call options if they thought the price would go down.

Economic bonanza, yield hungry investors and the popularity of Credit Default Swaps (CDS) resulted in ballooning price of corporate bonds, which risk spreads reached extremely low levels versus their correspondent government bonds. Commodities prices also skyrocketed, helped by extraordinary demand from emerging economies, but retail and institutional investors were also offered the possibility to invest into this asset class by the popularity of certificates, known as Commodity Exchange Traded Funds (CETF) which would replicate the price movement of certain commodities, mainly by investing in the futures of these commodities. With this innovation, a humble Japanese saver could be investing into gold, oil or even platinum with very limited amount of money.

This enormous liquidity even reached emerging market bonds. In the autumn of 2006 money invested in emerging market bonds offered a return just 1.3% above that on money invested in US government bonds. How can we explain how countries where common sense ought to tell us there is a risk of default can obtain finance with such a small increment on that paid by the US government, which has never failed to pay its debt? The answer lies in excess liquidity contributed by the diffusion of derivatives. When the money supply is normal, assets are assigned prices that are rational, in the sense that there are notable differences between the return on emerging-market debt (where there is a bigger risk of default) and US debt. If the money supply keeps expanding (i.e. money is cheap) once "rational" prices have been reached, this will keep driving the financial market to search for better returns. The problems start when the search is based only on returns and not on a calibration of the risk of the assets, as this is the point at which the seeds of a financial crisis start to be sown. Something similar happened when billions and billions of dollars poured into subprime mortgages in the US. Once the bubble had burst everyone agreed that it made no sense to have put so much money into mortgages which had such a big risk of default, but very few people had been able to predict events before the crisis exploded.

Readers will be able to guess for themselves what the common nexus linking all these factors is. This nexus, namely liquidity and the lack of it, is what explains how all these decisions came together in a dangerous alignment of the stars. Market confidence plays a crucial role in the transition from an excess of liquidity to a shortage of it. A minor event, such as the default on a series of subprime mortgages in February 2007, was enough to cause this change in confidence, which then brought down the whole house of cards built on excess liquidity.

These ideas are not new. Indeed, they were formulated in the US in the nineteen seventies by a neo-Keynesian economist called Hyman Minsky. Minsky put forward the "financial instability hypothesis", which states that in a world in which there is confidence in the effectiveness of the central bank and its ability to control inflation, banks will react to this confidence by expanding their credit portfolios. This expansion

leads to an increase in the price of real assets in which the money provided by the bank ends up being invested (mainly property). The increasing price of these assets, together with the money supply, will lead to a reduction in defaults, which will create more incentives for banks to expand the volume of loans, again leading to greater increases in asset prices, increased liquidity and lower default rates. This leads to a vicious circle in which loans are given without distinguishing the risk, such that it only comes to light when an event such as a default on series of mortgages causes market panic, and this in turn causes the opposite phenomenon to that just described: there is an almost complete freeze on new loans, which in turn leads to an economic crisis, a drop in asset prices, increased default and tighter restrictions on bank lending. In other words, commercial banks do not smooth out economic cycles but aggravate them. According to Minsky, from this fact it can be inferred that when conducting economic policy it is necessary to study how to avoid this threat. Minsky's arguments did not meet with widespread acceptance. However, the extraordinary liquidity situation between 2004 and 2006 that was facilitated by the widespread use of derivatives led certain leading economists (including Martin Wolf, chief economist at the Financial Times, and George Magnus, economics advisor to UBS), to rescue Minsky from oblivion and warn of the risk faced by the financial system on which economic expansion had relied.

Unfortunately no policy maker took any prevention to avert the disaster that was being shaped, a disaster of liquidity that had been clearly exacerbated from Minsky's times by the spread of derivatives.

Section 2

The risks embedded in Credit Default Swaps

In corporate finance it is widely assumed that the starting point for the valuation of a company is the risk free rate. Hence, if the US 10 year bond stands let's say at 3.5%, this rate shall be the starting point to which different risk premium will be added to obtain a meaningful discount rate at which the present value of the cash flows generated by a company could be calculated.

With the appearance of credit default swaps, a totally new horizon emerges which needs to be embedded into corporate finance valuation. For instance, if the CDS to protect a potential default from a US Government bond stands at 0.5% (50 basis points), then it would make sense that the real risk free rate at which the cost of capital of a company should begin to be calculated would stay at 4% (3.5% plus 0.5%).

Yet, let us raise one question: if the US Government defaults, would our counterpart in the CDS contract be able to honour its commitment to pay us the amount we agreed to protect in the case of the default? In other words, which institution would have a healthy balance sheet to honour commitments if an event such as default of the US Government is taking place on earth?

This dilemma places the central question behind the real value of derivatives: the points and the events which make the real value of derivatives differ from their theoretical value. The implications of these differentials in systemic risk of the financial sector are considerable. And the eventual transformation of derivatives into credit availability for consumers and companies, if not taken with care, can become lethal.

For the sake of clarity let us make clear several starting points referring to derivatives:

Notional value stands for the amount of the contract being underwritten between to parties entering into a derivative agreement. If party A wishes to protect USD 10 million of bonds of company C from default, and to do so A enters into a CDS agreement with company B by paying it an annual premium of USD 100,000 this will mean that the physical transaction will be just 1% of the notional amount. This clarification is important, as people only exaggerate the economic importance of derivatives by focusing on notional amounts, not trade amounts.

Yet, the relationship between underlying assets and the derivatives being traded on those assets should never be left out of sight. There are in the world corporate bonds with an approximate value outstanding of USD 5 trillion. In early 2007, the notional amount of CDS written on corporate debt was circa USD 50 trillions (it stands below 30 trillions today). This means that the relationship between the underlying asset and the derivative is 1 to 10. Let us suppose that due to the fact that company C is starting to have problems, the price of the bonds of this company fell down. There are USD 1 bn. in such bonds, and USD 10 bn. in their corresponding credit derivatives. Theoretically, the price of the bonds of company C should come down as a result of its financial troubles. Yet, due to the fact that an impressive amount of derivatives linked to these bonds need to be settled, it could occur that in reality, the price of these bonds go up as demand to hold the underlying asset in order to settle the derivative could produce such an irrational move.

Now let us assume that we live in a world without credit derivatives. Company A holds USD 10 million of bonds of company C. As company C moves into financial distress, the price of these bonds comes down. As A wants to secure the maximum recovery out of this asset as possible, A will work with shareholders and other creditors of company C in order to prevent its bankruptcy and to make sure C becomes viable in the mid term it will facilitate a new business plan to secure the survival of the company. In this negotiation both shareholders and debt holders need to make sacrifices, which tend to be more severe for shareholders to take into account the riskier nature of their claims to the company's assets. Let us imagine that as result of these negotiations a new C is created and debt holders have agreed to a write off of 20% of the face value of their bonds. The final result will be that company A will have lost 2 millions, and will be entitled to receive USD 8 million of its initial USD 10 million investment.

Now, let us complicate the scenario by introducing CDSs. As company A holds both the bonds worth USD 10 million of company C and the protection from default of these bonds by the CDS contracts it has purchased. The CDS contract establish that company A will be entitled to receive a payment of USD 10 million if a bankruptcy of company C occurs. As company C enters into financial difficulties, the risk and reward equation for company A has completely changed from the previous case, as in the present circumstances, company A will be incentivised not to avoid but to promote the bankruptcy of A, as this will be the only way how A will be able to recover its investment.

The rules of the game have changed, and as the incentive mechanisms have changed, the attitude of A will also evolve towards one (seeking bankruptcy of C) that will certainly increase systemic risk. As a result of the transaction, company B will honour its commitment with A by paying USD 10 million in exchange of company A's bonds in company C, and will try to find any residual value that it could be extracted from these bonds if in the liquidation of the company if such an event there are assets left to the bond holders.

When financiers and economists try to predict corporate bankruptcies during recessions, they often look into history and find relevant data of bankruptcies in difficult moments. That is how we find that corporate defaults in the 2001-2002 and 1992-1993 crisis stood above 10%. 15% is now deemed to be the potential bankruptcy rate we could be expecting between corporations during the current crisis. Yet, in those two past crises CDS were almost no existent. The current notional value of CDS contracts of USD 26 billion could trigger bankruptcies that could well stand above historic rates, just as a result of the incentive mechanisms above described linked to the trigger event being associated with the bankruptcy of a company. The recent case of the bankruptcy of GM is a good illustration of this situation[4].

Another misconception stands on the value creation or even value destruction generated by derivatives. If company C defaults, B will have to pay A 10 million USD, hence generating a transfer or value from C to B. Yet, if as a result of this commitment and similar others occurring at the same time company B is unable to fulfil its commitments, then B will enter into bankruptcy, generating not only a loss for A, but for all the creditors of institution B. This notion implies that it is critical to understand correlations between the different risks protected through derivatives being sold by company B, as if correlation is high, an extreme event (called in academic literature as a "black swan") can produce a very sharp increase in obligations due to company B, which, if unable to pay, would produce a bankruptcy that can generate other related losses and more trigger events… a vicious circle of systemic risk has started.

4 "CDS investors hold the cards as groups try to exchange debt", Financial Times, July 23rd, 2009.

On the other hand it could be the case that company A has cut down its exposure to C by selling to a new party, D, the bonds it held on C and sold CDS on company C that party D in the same amount as it had bought from company B, hence netting the initial exposure it had to zero. The result is that out of USD 10 million of bonds in company B, USD 20 million of CDS contracts have been created between A and B, and A and D. Theoretically, A should be free from any risks occurring in company C. Yet, if both companies B and C default, which could be the outcome? Even though company A theoretical risk is zero, in practice it could lose USD 10 million dollars, as company A will have to pay the USD 10 million it promised to pay under the CDS it sold to the third party, whereas company B cannot honour its commitment to company A to pay USD 10 million due for the CDS that A bought from B. This is another key element of systemic risk that should be considered. Put AIG as company B and you will immediately understand why the US Government rescued the US insurance company.

To solve part of this problem, "trade compressions" are being taken. Market makers of CDS exchange information and try to reduce systemic risk by, in cases such as the one described on the above paragraph, eliminating A from the CDS relationships, hence bringing down USD 10 million out of CDS contracts. This explains why the notional amount of CDS, which stood at USD 57 at the beginning of 2007, stands now at below USD 28 bn (of which below 16 bn. correspond to single names and below USD 12 bn. to indexes, where traders buy protection against a default of a pool of names).

After the collapse of Bear Stearns two years ago, 17 banks that handled about 90 per cent of trading in credit derivatives agreed to follow steps including tearing up trades that offset each other to help reduce day-to-day payments, bank staff paperwork and potential for error. The tear-ups do not reduce the actual amount of default and market risk outstanding, but may reduce the amount of capital commercial banks are required to hold against the trades on their books.

In summary, are CDS weapons of mass destruction? Up to now, these derivative have not had a central clearing house, they have counterparty risk (such as AIG), that can become systemic (USD 55 trillion, in notional value in 2007, the size of the world's GDP), their trigger event is bankruptcy, hence if you hold a CDS you want to make sure the company goes bust, not the opposite (when you have a bond you try to rescue the company). All these are reasons to support the view that CDS were in fact weapons of mass destruction and clearly contributed to enhance the severity of the financial crisis.

Asset backed securities: CDO, CLO

The securitization played crucial role in the formation of the housing bubble and the credit crisis that we have witnessed in the past couple of years. It wasn't meant to be like that. The synthetic structures like collateralized debt obligations (CDO) and all other variables – CDO squared, CLOs etc. were supposed to spread the risk among investors. The rating agencies were judging these structured products with models with questionable assumptions (based on just a few years of historical data), for example that the house prices would never fall, which proved to be dead wrong. This gave the investors false security and allowed them to accumulate even greater risks. As all these structures were OTC the level of systemic risk proved lethal.

Implications of ETFs and their use of futures to trade commodities

According to Barclays Global Investors[5], the Global ETF industry peaked in mid-2008, when it held asset worth approximately USD 805 bn. This coincided precisely with the peak of the commodity bubble, including the oil. The flow of funds to the ETFs continues as opposed to the conventional asset managers, despite the sharp decline of the prices of almost all asset classes.

The remarkable boom and bust of the commodity market that we saw in 2008 was in fact partially caused by the rapid growth of the commodity ETFs. The spike in the price of oil that reached a record high of nearly USD 150 and then its fall to USD 30, the tripling of the price of rice in a matter or months, all of these partially had to do with the speculation with commodity derivatives. As one retail investor acquires an oil ETF, the bank managing the ETF will be buying the corresponding number of futures in the oil curve.

The main flaw with those ETFs, based on commodity futures is that they are open-ended funds, which invest in the assets that are closed-ended (due to regulations or liquidity). From that contradiction come many of the issues with the commodity based derivatives and ETFs. Many experts say that the reason for the distortions in the commodity prices and especially oil is the huge number and size of the ETFs that track the markets and compare them to Ponzi/Madoff scheme.

Let's take for example an ABC Oil ETF that is being funded by a proliferation of new retail investors looking to diversify into "alternative investments", such as commodities. If the market is in contango (which is the normal situation with the commodities) and the investors simply use buy-and-hold strategy, every time the fund rolls-over its positions, their cost rises because of the higher priced deferred contract.

As a conclusion, even though asset prices in the long term should reflect fundamental values, in the short term large disequilibrium of demand (excess liquidity) can

5 Barclays Global Investors report, July 2009

generate asset bubbles, such as in commodities, which can have very negative systemic implications.

OTC Equity linked derivatives

As retail investors were acquiring exposure to let's say the movement of the SP 500 through a Lehman Brothers certificate, these investors were incurring not only in SP risk, but also in counterparty risk with Lehman Brothers. The reason is the OTC structure of these certificates.

The operational risk that exists there for the market participants is enormous, because of the lack of a clearing house and the counterparty risk. Additionally, the OTC derivatives pose unsuitably high amounts of risk for small or inexperienced investors and have huge notional value of more than hundreds of trillions of USD.

As one of these major houses such as Lehman Brothers fells down, the damage inflicted upon millions of investors (mainly through the distribution of these certificates through private banking networks) was remarkable. In turn, private banks distributed these high risk structures as their cost was high, hence they obtained important kick backs from the originators (Lehman Brothers), exposing a very clear conflict of interest between their advisory function to wealthy individuals and their incentive scheme.

There is an interesting issue with the OTC options trading. Many experts note that it vastly influences the futures, options and stock markets. Barron's[6] notes that many investment banks transfer their risk from creating these custom options to options market makers at exchanges. The latter then trade future contracts, which liquidity influenced the stock markets.

The role of index future in quantitative selling

As stated above, the many of the quant models that were used in from investment banks to rating agencies, relied on assumptions that were proved to be wrong. Quantitative funds were programmed so that if certain value at risk levels were reached due to falls in the stock market, then the machines would start selling futures on the market to mitigate that market risk. Yet no quant model foresaw the possibility that all the machines would be selling futures at the same time. August 2007 something extraordinary happened – events that were supposed to happen once in every 100 years occurred various times in the terms on couple of days. The volatility spiked to unseen levels and that caused enormous disruptions. The so called "black swans" had a particularly devastating effect because of the high leverage that hedge funds, investment banks etc. had. The wealth destruction produced in these funds was a vital factor in

6 Barron's, June 2, 2007

destroying investor's confidence, prompting the asset allocation towards government bonds, favoring the liquidity trap and killing private investment.

Sadly enough, exactly the same story had occurred in October 1987, a financial crisis mainly enhanced by the selling of futures by quant models all at the same time. Again, we perceive that financial markets do not learn from historical lessons.

Section 3

Key recommendation for policy actors and bankers in order to prevent derivatives from becoming systemic risk enhancers in the future

Tackle employee compensation

The truth is, risk tolerance is antithetical to successful investing. When people aren't afraid of risk, they'll accept risk without being compensated for doing so… and risk compensation will disappear.

Imagine you are an employee in the fixed-income division of Lehman Brothers in New York. Your job is to grant bridging loans to US mortgage agencies specialising in subprime lending. These agencies repay their bridging loans by selling your bank the mortgages they have granted. You package all these mortgages into a bond issue specially created for this purpose with derivatives embedded. As the mortgages are drawn from right across the United States, geographical risk is minimised. Thus, there might be a drop in the property market in Los Angeles, but this would be offset by a boom in Atlanta, for instance. After all, it is inconceivable that the value of homes could fall all over the US fall at the same time. The company with which the mortgages have been deposited issues bonds whose payment is backed up by these same mortgages, and institutional investors in the EU and worldwide buy the bonds on account of the guarantees they offer (the mortgages are backed up by property) and their high returns. In the process of granting bridging loans, buying subprime mortgages, packaging and reselling them to institutional investors (a process known as securitisation), your bank obtains a good return (they have been given an AAA rating, the highest possible, by the rating agencies, and despite their very low risk, offer returns 1% above those of US treasury bills).

You are paid a fixed salary of 125,000 dollars, plus a bonus that depends on the amount of business you help to generate for your bank. During 2005 your bank rewarded you with a bonus four times your salary (500,000 dollars) to ensure your loyalty to the firm and avoid your working for a rival bank in such a profitable business line. You are currently (second half of 2006) preparing the purchase and securitisation of a billion dollars' worth of subprime mortgages granted during the first half of the year. You are aware that there is a lot of abuse taking place in the way these mortgages are being allocated, as when they are sold to third-party investors (many of whom are international), mortgage agencies do not worry about only giving mortgages to good risks, but are granting mortgages on a massive scale without concerning themselves

about borrowers' credit quality. However, your job consists of buying these mortgages and reselling them (a process which takes around three months). This would only be a problem if this risk you know exists were detected during the three months the billion dollars is on Lehman Brothers' balance sheet. If you warn of the risk and cancel the transaction the most likely outcome is that you will not get a bonus, as all your business this year is concentrated in this transaction. If it goes ahead, the size of the deal is such that you estimate your bonus could be as much as 800,000 dollars, payable at the end of December. What will you decide to do?

Current remuneration systems have led to employees taking high risk positions without taking into account the consequences for investors, shareholders, and in the final instance, tax payers. Proprietary traders involved with the use of derivatives received a sizeable share of their income in the form of variable bonuses. Thus, the more profitable the trader's transactions on behalf of the bank, the bigger the bonus. Most traders took high risk positions through the use of risk enhancement derivatives, as risk was associated with returns on trades and therefore with an increase in their bonus. If the deal turned out well, the financial reward would be significant. And if it did not, the trader would lose his bonus, or at worst, be sacked and receive a generous severance payment. What lesson has been learned? Short-term objectives aimed at earning a bonus are harmful to the bank's management policy, to the extent that they put its solvency in jeopardy. Let's assume that branch managers set our variable remuneration according to the number of mortgages granted. With this requirement we would most likely concentrate our efforts on winning new customers, and would probably be less concerned about their future solvency, as, in Keynes's words, "in the long term we are all dead."

The situations of risk linked to derivatives to which institutions have found themselves exposed in order for employees to earn bigger bonuses have been excessive, leading even to some institutions going bankrupt. To avoid this happening again in the future, various institutions have proposed a list of best practice for employee remuneration. These standards try to align compensation policy with the institution's risk-management policy. What are the compensation practices to avoid?

1. Calculating remuneration based on the income reported by employees without taking into account additional considerations regarding their risk;

2. Referencing employees' bonuses solely to the year's earnings, without taking into account earnings in subsequent periods;

3. Increasing the ratio of variable to fixed income;

4. Paying the whole bonus in cash – it is advisable to employ a mixed remuneration policy, using share option plans or shares in the company, so as to increase employees' commitment; Variable remuneration, for example in the form of restricted shares (shares which cannot be sold until a given number of years have passed) is useful as a way of aligning employees' decisions so they are good for the company over the medium term;

5. Inadequate separation of front office and back office tasks.

As a conclusion, this section has left it clear the perils of employee compensation linked to short term objectives and the risks associated with the embedded derivatives. Those institutions which have the balance sheet to become systemic threats should be monitored in their incentive schemes in order to avoid the concentration of high risk positions derived from the compensation scheme. This is specially applicable to the proprietary traders which can use derivatives to increase the short term risk and return of the positions, what can result in a dangerous dilemma of we win you lose, as we have seen the last two years. As quite often derivatives are hard to value, a lot of subjectivity can be employed to determine high valuations resulting in high bonuses. If derivatives are being employed not to hedge risk but to take risky investment views, then compensation should be linked to mid term outcome of these positions, and not linked to year end estimated value of these positions. As derivative positions tend not to be as liquid as cash positions, linking retribution to mid term performance of these positions, and ideally to the final closing of the position, might reduce the incentive to aggressively acquire risk through derivatives and subjectively value these positions in the short term.

Change the governance of rating agencies to prevent global contagion

Paradoxically the first victim of the US subprime crisis was a German bank, IKB, in late July 2007. Germany is a country of savers, with no property bubble, and yet it took a direct hit from the crisis. The contagion mechanisms made it vulnerable. However, the effect of contagion is relatively simple.

Through CDS and CDO, packaged into collateralised debt obligations, numerous European institutions bought exposure to US subprime risks. The reason was simple: an AAA grade investment in a German bond paid considerably less than an investment in a AAA subprime mortgage security with embedded derivatives. For the treasurer of a bank like IKB whose goal it was to maximise the profitability of the bank's portfolio, and whose bonus probably depended on it, when choosing between two AAA investments he would tend to choose the one offering the highest return, even though in the back of his mind he might be aware that the real risk was greater than that suggested by the AAA rating.

Many readers have probably been wondering how it is possible that prestigious agencies such as Moody's, Standard and Poor's or FITCH IBCA, were offering top credit ratings (AAA, which is similar in quality to Germany's or the US's national debt) to packages of high risk mortgages with complex derivatives embedded. Before explaining how this was possible it is worth pointing out that credit rating agencies operate in near-monopoly situation, as central banks, when they lend money to commercial banks, demand assets with the highest rating from the three rating agencies as collateral. This means the market is virtually closed to new competitors. This lack of competition explains in part how the agencies have made such high profile mistakes on occasions, such as when rating Enron's or Parmalat's bonds (which they judged to be investment grade until the day the bankruptcy was announced). The agencies have always appealed

to freedom of expression (as if they were newspapers) to defend themselves against the collateral damage their mistakes have caused in the financial system or the economy. At the same time, it is worth highlighting that the rating agencies are paid by the issuer. Thus, if France Telecom wants Moody's to issue a rating of its bonds, it would be France Telecom that pays Moody's, leading to a clear conflict of interest.

To tackle this problem, we propose that Central Banks do accept as collateral for financing to the commercial banks paper rated by agencies different that the top three, as this situation creates an oligopoly that distorts the market, create inefficiencies and enhances systemic risk.

The current crisis clearly showed that the models that the rating agencies use to rate the derivatives instruments have serious flaws and should be revised. The assumptions such as the house prices would never fall or relying on simple risk models like VaR, that does not take into account rare events have given investors false security and undermined rating agency's credibility. Hence, we believe it is a good idea that ratings assigned to structures backed by derivatives are rated using a rating scale different to the standard ones. This is justified by the fact that there is a long history of data of bonds and insolvencies, but data is very limited when looking at derivatives and their performance. A different scale would allow investors to look twice into structures before purchasing them, and would also make investors think twice before outsourcing their job of looking into the structure risks before taking the decision to purchase it.

Finally, rating agencies should reach governance standards similar to those applied by large auditing firms after the Sarbanes Oxley legislation, including prevention and eventual disclosure of consulting services, peer revaluation of ratings, oversight of activities and a clear conflict of interest public policy.

Establishing of clearing houses to reduce systemic risk

A solution the problem of concentration of derivatives position in a few major banks might be the establishment of a clearing house. George Soros in his book *The New Paradigm for Financial Markets: The Credit Crisis of 2008 and what It means*, talks about the importance of the establishment of a clearing house for CDS in order to stabilize the markets (pages 145-146):

> One specific measure that could help relieve the credit crisis is the establishment of a clearing house or exchange for credit default swaps. Forty-five trillion dollars worth of contracts are outstanding and those who hold the contracts do not know whether their counterparties have adequately protected themselves. If and when defaults occur some of the counterparties are likely to prove unable to fulfill their obligations. This prospect overhangs the market like a Damocles Sword that is bound to fall, but not yet. It must have played a role in the Fed's decision not to allow Bear Sterns to fail. There is much to be gained by establishing a clearing house or exchange with a sound capital structure and

strict margin Some Policy Recommendations 145 requirements to which all existing and future contracts would have to be submitted.

The advantages of moving over the counter (OTC) derivatives towards an exchange traded system with a central clearing would stand at,

a) Lower systemic risk, as guarantees would be asked for as the risk embedded into every derivative changes, hence moving the bilateral trades into a centralized system which assures the fulfillment of the contracts, as it occurs in the stock market,

b) More representative price fixation closer to the truth, as prices derived from over the counter transactions tend to be more difficult to obtain, and its frequency and quality, questionable.

c) Standardization of the contracts should occur as a consequence of the movement into a central clearer, hence cutting down systemic risk and facilitating the eventual melt down of a financial institution without creating a huge legal mess, as it occurred with the debacle of Lehman Brothers, which had written very different CDS contracts with many counterparties, many of these contracts being 30 pages long each with specific clauses and different trigger events.

d) Clarity on the final ownership of the ultimate bearer of the risk and rewards of derivative contracts, cancelling cross trades, hence contributing to reduce systemic risk.

e) Reduction in the number of systemic institutions needed to be bailed out in the event of a crisis, as Governments would just need to make sure that these central counterparty clearers stand alive.

Re think derivatives accounting

There is so much that's false and nutty in modern investing practice and modern investment banking. If you just reduced the nonsense, that's a goal you should reasonably hope for.

To sketch out the implications for accounting, let's start by looking again at the case of Bear Stearns. Confirmation of the rumours about Bear Stearns' solvency came with the presentation of its annual report in March 2007. The central topic highlighted by the report was that marking the bank's assets to market so as to recognise them at their fair value would mean a loss (the drop in value of an asset is reflected on the accounts as a loss which results in an immediate reduction in equity) which would put the bank on the verge of bankruptcy. But how had this come to pass?

Accounting standards were harmonised by applying International Financial Reporting Standards. International Standard no. 39 establishes the valuation standards for financial instruments, this rules the valuation of derivatives. This standard classifies

financial instruments according to their nature (tradable investments, investments in the portfolio of assets held until maturity, loans, etc.) and assigns different valuation methods accordingly.

The various different types of financial assets, and specially relevant are derivative based structure assets, a bank may hold on its portfolio, which as we have just mentioned relates to their nature and intended purpose, are the following: first of all, it is worth mentioning those which in accounting terms are called trading assets. Assets of this type are bought by the bank with a view to obtaining a short-term return. The accounting rules indicate that they should be valued at market prices, and changes in their value reflected in their valuation. Imagine, for example, that our institution purchases a hundred call options on Repsol shares at the start of the year. When the bank buys the options it will include the one hundred Repsol options bought at 25 euros a share on its balance sheet as financial assets. The balancing item at time zero is the cash paid. However, what happens eleven months later when each Repsol call option is worth just 15 euros? The standard in this case is clear: the loss of value represented by Repsol's falling share option must be reflected on the institution's balance sheet, with a reduction in the value of the asset and a loss will be registered in the profit and loss account.

A second category of asset includes those assets deemed to be available for sale. These are referred to as assets held for sale. How do these assets differ from trading assets? As the standard says, the difference lies in the purpose for which they were bought. If we go back to the previous example, but assuming that in this second case our institution buys the Repsol options without aiming for a short-term return, but a strategic investment in Repsol. Thus the options are held on the bank's portfolio with no immediate prospect of their being sold. What are the accounting consequences of their being included in this new category? Although the accounting rules again oblige us to recognise the asset (i.e. the options) at market value, the impact of the loss of value is not charged against the profit and loss account but against other balance sheet accounts. The aim is to avoid harming the earnings if there is no prospect of the asset's being realised in the near term.

According to the standard, the bank's investment strategy decides whether a financial asset is classified in one accounting category or another. This means that with a short-term model the earnings account is more sensitive to variations in asset values.

The third category of assets comprises assets held to maturity. Let's assume that on this occasion the institution's portfolio managers decide to invest in a CDO with the intention of holding the structure to maturity. The valuation is different from that allowed by the standard in the other two categories. The CDO could be valued at their historic cost, with a discount for the effect of time.

The way market value is treated takes on special importance in this accounting contrivance. In many cases, particularly in that of over the counter (OTC) derivatives directly traded between two firms or counterparties, assigning a market value is no

straightforward matter, as there is no organised market for these products. Thus calculations of their value are affected by numerous subjective factors. This has led to a play on words among some theorists, who have asked "how fair is fair value?"

The credit crisis has demonstrated that in the context of a profound financial crisis, such as that which has been taking place over the last few months, market values are not always a faithful reflection of the underlying economic reality of the assets concerned. That is to say, in a context of sharp falls in asset prices, the market price could not reflect the fundamental value. Returning to the previous example, the ten euro drop in the Repsol option price includes a significant loss on the earnings account (in the case of an asset bought for trading). With a short-term perspective, however, the option price looks like a good benchmark for their value. But, what happens when the asset that has been bought is not as liquid as Repsol options? The lack of liquidity becomes a major problem as the lack of selling prices from equivalent transactions means it is impossible to be sure that the price assigned by the market is the best reflection of the asset's economic value.

Let's suppose we have bought a house in a small housing estate with three terraced houses. The house cost a million euros. One of our neighbours is obliged to sell his house in under ten days for personal reasons and the only buyer he can find offers him 700,000 euros. The sale causes our neighbour a loss of net wealth, but should the third neighbour and I recognise the same loss? Would this be a fair value? Probably not, as the loss suffered by the owner of the house that has been sold may have been influenced by his pressing need for liquidity.

Aware of the importance of the accounting treatment of transactions and the importance of market value when accounting for derivatives US and international regulatory bodies (the Financial Accounting Standards Board and the International Accounting Standards Board, respectively) issued an annex to the international standards. This annex permits reassignments of financial assets between categories, so that if the bank has a portfolio of bonds backed by mortgages that are listed on a market, but it decides to hold these bonds to maturity, it can, for example, pass their value from the trading book to the credit book, thus changing the valuation system applicable from market value to historic cost (many banks did this in the third quarter of 2008, so as to minimise the value of their losses).

The consideration of fair value in accounting has been jeopardised and battered by the financial crisis. Perhaps it might have been more reasonable for these losses to have been recognised more gently applying the more traditional approach in effect prior to the International Financial Reporting Standards (the international rules have fed a vicious circle of asset sales and falling prices). But when the opposite happened, i.e. continually rising prices and profits, why did nobody criticise the accounting treatment that was yielding such fat profits for the banks?

Prevent the use of derivatives as a weapon to increase bank leverage

Imagine you are Chuck Prince, the CEO of Citigroup in late 2006. Your organisation has been enjoying unprecedented profit growth. Part of this growth has been due to the expansion of their assets through the purchase of structured products with embedded derivatives. Thus, mortgage opportunities have allowed Citigroup to accumulate subprime bond securitisations (CDOs) with the highest (AAA) credit ratings, offering very attractive returns. Being AAA products your bank can take on these assets with barely any need to increase its equity. Thus, with equity of 60 billion dollars, total assets have now reached a trillion dollars. By concentrating returns on such a small volume of equity, the return on equity (ROE), the ratio most closely followed by analysts, has risen sharply since 2002. At this point, you have to decide whether to expand the balance sheet further to take on a five billion dollar share of a fifteen billion dollar securitised issue. The assets are structured bonds backed by subprime mortgages with a maximum credit rating (AAA). You know that this uncontrolled rush of liquidity cannot end well, as just as soon as the ease of obtaining loans changes, many of these mortgages may turn sour, which could be a deadly blow to the banking system and the economy as a whole. However, analysts are watching Citigroup's earnings under your management on a daily basis. If you decide not to add these products to your balance sheet the likely outcome is that profits will stop rising in line with analysts' and investors' expectations, and the market may call for your resignation. If 2006 ends the same way as 2005 (without problems) you can expect to obtain a total income of forty million dollars. If you are sacked, your severance package guarantees you at least 125 million dollars. Bearing this in mind, will you decide to include these mortgages on your balance sheet despite the fact that you are aware of the risk?

The banks welcomed this situation with open arms as it meant they could expand their credit portfolio easily, while reducing defaults and minimising their use of equity, thus encouraging debt, and maximising shareholder returns. The result is that whereas the financial sector accounted for barely 10% of US gross domestic product (GDP) in 1980, by 2007 it produced almost 40% of GDP, thus underpinning the US economic expansion. However, this growth also brought dangerous instability with it, with the potential to affect the global economy. As the remuneration of the vast majority of the industry's employees is linked to short-term objectives, the incentives to focus on immediate profitability and ignore medium-term risks were enormous, worsening the problem created by the excess money supply. Moreover, many banks opted to take advantage of the lucrative business of investing in AAA mortgages offering high returns by obtaining much cheaper finance from short-term financial markets (asset backed commercial paper), thereby obtaining huge profits (short-term debt was issued at a cost of close to 4% for investments in AAA subprime bonds or Alt A[7] bonds,

7 American mortgages are divided into prime, which are those which meet certain risk criteria, in particular those granted to middle class families and with the backing of the agencies Freddie Mac and Fannie Mae; subprime, which are those which

producing profits of 6%, thus leading to the illusion of its being possible to earn money for free).

To make matters worse, a number of banks opted to conduct this business off their balance sheet. This meant setting up companies known as structured investment vehicles (giving third parties access to their capital), or conduits (which only had bank capital), charged with investing in these mortgages linked to derivatives, and financing them from the money market. They were sponsored by banks such as JP Morgan, Citigroup or Goldman Sachs, which meant that the money market agreed to finance these investments as it assumed that in the event of a problem funding the assets the sponsoring banks would bail out their subsidiaries, even if they were off the balance sheet. The problem that was brewing was that if there were to be a change in the economic cycle or loss of confidence at any time, the money market could dry up, as once investors lost their confidence they would no long distinguish between the instruments sold on money markets that were backed up by good assets and those that were backed by bad ones. The result of this kind of loss of confidence is that solvent companies that use this market on a daily basis to finance critical activities, such as paying salaries, could end up being affected by the contagion and have their finance refused. This happened in the autumn of 2008, forcing top rank companies such as General Electric, which used this market to finance its working capital requirements, to issue bonds.

Part of the problem lay in the disproportionate growth in the size of many banks' balance sheets. At the start of the 20th century a commercial bank operated with leverage (i.e. the ratio of its debt, primarily deposits, to its equity) of 4 to 1. This ratio increased considerably over the course of the 1980s, and by 2007 many European banks had leverage ratios of over thirty. In the US the maximum leverage commercial banks were allowed was twenty (investment banks were exempt), this is why the crisis affected US investment banks and European commercial banks in particular so severely.

However, since the implementation of the Basel accords, the way in which the solvency of financial institutions is measured has changed, and a new concept called value at risk (VAR) has been brought into play. The capital or equity needed was calculated based on the credit, market and exchange rate risks. Each different type of banking activity has a risk associated with it, such that if the institution's asset portfolio is high quality it requires less capital (Tier 1) than if the assets are riskier. The Basel I system allowed this credit expansion, as it assigned a coefficient to each asset according to the perceived

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do not meet these criteria, in general having been granted to lower class families; jumbo mortgages, or mortgages over a million dollars, which are primarily aimed at the upper class, and Alternative A mortgages, which are mortgages given to individuals whose lack of a record makes it impossible to give them a classification. In practice, many Alt A mortgages followed the same pattern as subprime mortgages.

risk. Let's imagine that Dexia included a 100 million euro bond backed by AAA-rated subprime mortgages on its balance sheet. According to Basel, an AAA-rated asset is weighted at 25% when calculating its risk. So, only 25 million euros would be taken into account. As Basel requires 8% equity for each risk-weighted asset, it is possible to back this 100 million euro position with 2 million euros of equity. In other words, it is leveraged 50 times. If the value of this bond dropped from 100 to 80, the damage would be huge as it would not only swallow up the 2 million euros of capital set aside but also a further 18 million euros being used to back other credit risks. With its capital reserves thus depleted, Dexia was obliged to sell assets in order to meet regulatory requirements. Considered in isolation this might have been a problem for the bank concerned, but when the risk, which had been sold all around the globe, affected many large banks simultaneously, which all set about selling assets in a market in which there were no buyers, it caused huge falls in asset prices, forcing the banks to sell yet more assets. This vicious circle explains the current situation. Will capital requirements be reformulated in the light of recent experience, such that it would be possible to talk of a bank risk management policy beyond that dealt with in the Basel accords? How will structured products with embedded derivatives be treated when calculating future capital cushions? In the next few years we will probably see a thorough rethink of the way in which risks have been measured following the Basel accords.

As a result of what has happened it will be necessary to place limits on leverage such that bank's solvency is not placed in jeopardy. As we have seen in the previous paragraph, in recent years the percentage of debt on banks' assets has been excessive. The regulatory capital requirements have proven to be inadequate, as many structured products which employed derivatives were much riskier than thought. The downturn in the markets and consequent loss of value of banks' assets has led to a shrinking of their capital to the extent that they no longer have the level of solvency required by regulators. One practical solution would be to go back to leverage ratios, so that banks will not be allowed to take assets above a certain multiple of its book value (let us say, 20 times). This ratio will not be broken irrespective of the risk of the asset or the derivative structure. This simple rule should prevent bank managers and proprietary desks from expanding balance sheets in the future through aggressive use of derivatives, hence limiting systemic risk.

A stable macroeconomic environment: tackling risk measurement

Let's highlight the impact of the property market on the crisis and its consequences in various economies. The property bubble, facilitated by the use of derivatives, that got underway in the United States in 2005, combined with the stable macroeconomic environment and very low interest rates, led to financial institutions relaxing their risk management policies, and this was especially worrisome when dealing with derivative products. Imagine you work in the risk management department of a financial institution. A colleague in the trading department asks for your authorisation for a derivative transaction which promises a high yield, but has a significant risk associated with it. Turning down the transaction leads to a confrontation between departments,

as given the stability and continuous increase in prices of the underwritten assets, it seems impossible not to recover the assets at risk. Finally, the risk department caves in to the pressure from the operations division and allows the deal to go ahead.

In January 2007 the world seemed to be risk free. In a context of stability (four consecutive years of low interest rates and falling credit spreads, i.e. the differences in risk between economic actors were not reflected in the interest rates) it is not easy to determine the potential risk of insolvency. Risk managers are responsible for approving transactions sent by the people in the front office. At the time, the possibility that there could be a lack of liquidity in markets was unrealistic. There was no shortage of institutional investors such as hedge funds, insurance companies and venture capitalists. All these players wanted to invest, and this excess liquidity meant firms, whether good or bad, had no problem obtaining finance. Thus, there were few bankruptcies, and the world as a whole reduced its estimates of future bankruptcies (which translated into minimal credit spreads).

Banks' proprietary trading departments, through derivatives, took positions in mortgage-backed bonds on the basis that as these assets were entered on the accounts at market value, the profit or loss would show up immediately on the books, and if difficulties emerged, these positions would be easy to liquidate, particularly in the case of AAA and AA tranches. Mortgage-backed assets required very little capital, making them very profitable.

As these assets were held on trading books they were subject to less exhaustive credit risk detection processes than assets held on traditional banking books. In a trader's eyes, the risk manager did not generate business for the bank, but was considered almost an obstacle to income generation. Complaints to the risk department were frequent. Even so, the risk department based its analysis of complex products on the ratings given by rating agencies, making for an explosive mixture. The boom years had marginalised the role of risk departments in banking institutions. Giving them back their role is a key part of the proper functioning of the system.

On occasions, if a bank had lent too much money to a company, the regulator or risk department opposed fresh loans being given to the same borrower. To get around this obstacle, the bank would buy 'insurance' so that if the company to which the loan had been given were to go bankrupt, the bank would obtain compensation. This insurance took the form of credit default swaps (CDSs). The bank paid a premium for this protection, and the insurance was sold either by insurance multinationals such as AIG or by investment banks. Banks lent and lent and lent, and when they could not lend any more, they bought CDSs and carried on lending. The system works if the insurance pays compensation when there is a problem with the company the bank is lending to. However, if there are a lot of problems with companies not paying at the same time, there is a risk that the insurance companies that have sold so much cover will not be able to meet their commitments either, thus leading to a systemic crisis. Given the huge number of CDS positions AIG had sold, its losses in the downturn

were enormous. However, so many banks were relying on AIG honouring its positions that the US government could not allow it to go bankrupt. It therefore nationalised it in September 2008.

As we have seen, to avoid future problems the need to create institutions that settle crossed positions in CDS contracts is being considered, as happens in the case of the stock market, so that fulfilment of the contract is guaranteed by this central organisation, which will require guarantees from each of its members. This would reduce systemic risk and add transparency to this market, which is of such crucial importance to finance in the 21st century. On the other hand derivatives risk should be treated as a core operation of any financial institution. This implies that a clear understanding on the risk embedded in the different derivatives being part of a structured product is key to assess and monitor the risk of the holder of such structure.

Section 4 – Main Conclusions

> Now, my dear, I must say that lately I have been having a great deal of luck in finances. Sir Harry McGowan asked me, before I left, that if the opportunity arose, whether he could buy shares on my behalf without asking me first. I told him that I could always obtain two or three thousand pounds sterling. I mentioned it as a limit on the investment, that is to say, the maximum outright purchase of shares. He clearly understood the figure as the limit I would be willing to go up to in the case of a credit purchase on margin. He therefore multiplied my usual scale tenfold [...] and in just a few weeks we have earned a small fortune[8].

The letter this quote is taken from was written by Winston Churchill to his wife one month before the 1929 stock-market crash. In it, the British politician was referring to how easy it was to make money on the stock market by means of "leveraged" purchases where the investor (Churchill) put up some money of his own (two or three thousand pounds) and the bank multiplied this bet with a loan. Thus, if the sum invested, say 200,000 or 300,000 pounds, yielded a return of 20% on the stock market, the profits would be between 40,000 and 60,000 pounds. A small share of this would have to be repaid to the bank as interest, but the rest would be profit for the investor: "a small fortune." Obviously, this kind of leveraged strategy worked well during a period of strong economic growth and rising markets. However, in a downturn, the risk for both the investor and the bank was huge. In the event of a fall in the stock market they would both lose their money, resulting in panic; which is precisely what happened in October 1929. What followed was known as the Great Depression, and the world described here unfortunately sounds very similar to that experienced between 2003 and 2007.

8 Quoted by P. JOHNSON, *Modern Times* (Translated back into English from the text quoted from the Spanish translation, *Tiempos Modernos,* p. 286).

In this paper we have exposed how derivatives contributed to the emergence of systemic risk during the 2001-2007 period, without generating any pre-emptive policy reaction to tackle this extremely dangerous systemic risk. Unfortunately, the relationship between derivatives and liquidity proved mortal, as we saw in the 1930s. We have exposed how systemic risk was built in the major classes of derivative contracts, with a special emphasis on credit default swaps. We finally have exposed some ideas on how policy makers should write new rules to prevent derivatives from becoming new weapons of mass destruction.

If applied, we will probably move towards the old times, when derivatives were use to hedge risk, not to enhance risk. Yet, this road will face many difficulties. Banks will oppose them, as the real secret behind banks profitability lies in generating obscure and complex structures which can attain a high margin. On the other hand, many members of financial institutions boards have proved too ignorant and incompetent to serve as directors, as they were unable to understand leverage or the implicit risks behind derivatives. A well known Swiss bank which faced very serious difficulties which prompted the Government's aid had only one member of the board with experience in derivatives, and the Lehman Brothers board included the head of US Red Cross and a well known Broadway play writer… experience in derivatives and risk was sacrificed at the expense of diversity. This tendency will probably change, and in the future knowledge of derivatives and risk management will be a key ingredient when selecting members of banks boards.

This road to create a framework where derivatives could be used to limit risks and not to expand risks will be tough and long. Yet, if attained, the future will be a much more stable but much more boring world.

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