Sub-Prime And The Credit Crunch

The global financial market is at its most critical juncture in almost 80 years. How did this happen? How can we resolve it and how can we prevent it from happening again?

This is clearly a global mess. Everyone, from central bankers and financial industry leaders to the man in the street, has a role to play in getting the world out of this mess. The purpose of this commentary is, therefore, to summarize in language everyone can understand, the key contributing factors that have led the world into this predicament and to suggest changes that could help get us out of it and avoid the same mistakes again.

Where are we Now?

In the US millions of home owners are facing almost certain foreclosure. The United Kingdom has had its first bank run in almost 150 years. Some investment funds are facing large losses; in fact some have already gone bust. Shareholders in financial firms are seeing their capital washed away in a tidal wave of write-offs that has yet to finish. John Thain, the former NYSE chief and now head of Merrill Lynch, has predicted that it will take at least six to twelve months to work

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through the problems.

Meanwhile, in a world awash with capital we are in the midst of a liquidity crunch. Lenders are doing what they always do in their inevitable way, fighting the last war instead of today's battle, by tightening lending criteria for all of their customers. This will make it difficult, more costly or perhaps impossible for everyone from credit-worthy home buyers to governments and corporations to borrow money on realistic terms, inhibiting new investment in productive plant and equipment that could keep the real economy going.

The world has changed a lot since Richard Nixon opened a relationship with China in the early 1970's. Even more has changed since the fall of the Iron Curtain in 1990. To everyone's benefit, some of the most significant changes during that time have occurred in the global financial marketplace.

One of the most profound changes has been the emergence of a new body of financial knowledge and practice called financial engineering, and the vast range of products developed from that knowledge. These products are commonly called "derivatives", and due to their inherently complex nature they are frequently depicted as semi-mystical beasts, often with malevolent overtones. What is unquestionable is that derivatives have played an important part in tying all the world's financial markets together, so that today we really do have a global financial market. As the major tools of financial innovation, derivatives have helped to transform the world's economic landscape.

As a result of this transformation, hundreds of millions of people have benefited. In the US, and many other countries, millions of families have benefited by being able to acquire their own homes. In emerging countries the cost of capital has dropped, enabling government and industry investment in important infrastructure and job creating projects. These investments have lifted living standards in dozens of countries. Much of this has been the result of the development of financial derivatives, which have contributed real value to our well-being by reducing the cost of capital for some, increasing investment returns for others, and enabling organizations to hedge their risks.

Over the last few years many people in the industry have taken satisfaction in the result; an almost unprecedented period of world-wide economic growth. A lot of the credit for it went to financial innovation. And it is true that it has played an important role, but at the same time financial innovation has also overlaid the markets with a layer of complexity that has led to ever more complicated explanations of how things work. Unfortunately, one of the victims of this has at times been common sense. Over the past few years, too much of the focus has been on the instruments and technical tools themselves, but they cannot replace knowledge, experience or insight,
At least three fundamental financial principles were forgotten or ignored: people are subject to human behavior; accurate information is important; and trust is the foundation of the financial markets.

1. Human Behavior - The first principle is that the financial market is not just currencies, or loans, or shares, or other assets. It is a dynamic organism. It is populated by people who, in spite of a vast increase in technical and scientific knowledge over the past few hundred years, have evolved very little. The market is still prone to the usual human behaviors of mankind acting alone or, scarier still, as a crowd. After all these years, the two most popular words still used to describe human motivation in financial markets are "fear" and "greed". So the first thing to remember is that the markets are subject to human behavior. At times human behavior is irrational. It can be irrationally exuberant, as Alan Greenspan pointed out a decade ago, but sometimes it can also be irrationally paranoid.

Yes, the market, due to globalization, is much deeper and usually more liquid. However, as witnessed by recent events, size and depth do not always offer the protection that some promised. In fact, globalization and the pervasity of the markets can amplify the size of problems that used to be confined to single markets. Just as the jet age has transformed what would have been a local flu epidemic in earlier times into a potential global pandemic, we need to be ever mindful that a financial crisis in one corner of the globe may have the potential to spread around the world. The crowd can be much bigger today, and it can communicate much faster.

2. The Importance of Information -

The second fundamental principle is that prudent financial decision-making requires accurate information. While cleaning up an earlier mess decades ago, it was recognized that for a financial market to survive and thrive, all the participants need access to full, true and plain disclosure of all the material facts. One of the most important facts to know is what your asset is worth.

If you own shares in a company that is listed on a stock exchange, like General Electric, and you want to find out their value, all you have to do is call your stock broker and ask what the current bid is. That is what someone will pay you for them. Similarly, if you want to know what your house is worth, the only way to find out for sure is to put it up for sale and get someone to bid for it.

Financial derivatives are different. Most aren't listed on exchanges. Derivatives are built with financial models. Some of the models are very complicated. Many derivatives are custom built by a bank for one of its customers, and sold directly to the customer 'over the counter'. Generally each derivative is unique. It is difficult to find a marketplace to establish a price for it. As a result, derivatives are valued using models. Models cannot provide a true market price because their output is not directly tradable. The values from the models are just approximations or estimates. Some models are good, so good in fact that the buyer and seller agree to use the model to set the price. But models are just tools and they have limitations. In particular, models are only as good as the assumptions and data that are used in them.

3. The Need for Trust - The third fundamental principle to remember is that, in spite of the intimidating size and sophistication of today's financial market, the glue that holds it all together is trust. The underlying cause of many previous financial panics has been mass fear driven by the erosion of investors' trust. The single biggest factor in destroying trust is lack of information or a lack of confidence in the information that is available. That is what leads to irrational paranoia. In the absence of good information investors fear the worst.

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Financial markets cannot function without trust. Lenders need to be able to trust that their borrowers will pay them back. Equity shareholders need to be able to trust that the management of the company is telling them the truth about the business and its financial results. Investors have to trust that markets function efficiently so that they can trade tomorrow an asset that they purchased today.

The predicament the market is in today, is in part due to mass forgetfulness. Too many people forgot that the market is a human-driven dynamic organism prone to fear and greed; that it depends on full, accurate information; and that, although it is big and smart in so many ways, it is also a fragile beast.

When something bad happens the inevitable response is to spend time and energy trying to place blame. One of the suspects that will inevitably be targeted is financial innovation, and especially derivatives. However, derivatives are not the culprit here, any more than automobiles are to blame for the thousands of car crash deaths that occur every year. Derivatives are just tools.

Ten key factors played a role in getting the world's financial market to where it is today. Without all ten, it may never have happened. But like the tumblers in a lock that remains firmly closed at as seven tumblers align, and then eight, and then nine; when all ten are aligned the lock opens.

1. Securitization – Provides a new large supply of money for home buyers.

One of the more successful types of

derivative, measured by widespread social benefit, is the class of products termed mortgage-backed securities (MBSs). These enable banks, the usual lenders to home owners, to package up portfolios of home loans into debt securities, and sell them to investors who want to earn interest on their money. Over the past few decades this has provided a vast pool of capital, and enabled tens of millions of credit worthy people to purchase a home. It also enabled investors to earn competitive returns with modest risk because the models used to value and measure the risk in conventional mortgages are well understood. It also enabled banks to sell their portfolios of assets, along with the risk of non-payment, to investors. Meanwhile the banks continued to earn fee income for administering the mortgages while their own capital was freed up to generate more business.

Over the past thirty years the American MBS market has become the largest debt market in the world, dwarfing the corporate and government bond markets. Its growth has paved the way for financial institutions to considerably increase the size and profitability of their businesses by leveraging their use of capital. Mortgage backed securities have become commonplace financial assets, widely known and purchased by everyone from prosperous dentists to institutional asset managers. This familiarity laid the foundation for complacency. People stopped looking in detail at the underlying assets in their MBSs.

2. Low Interest Rates – Make using leverage attractive.

The dot com crash occured in 2000, followed by the terrorist attacks the next year. The economy appeared to be heading for trouble, so to spur economic growth the US Federal reserve aggressively reduced its benchmark Federal Funds rate, eventually down as low as 1%; a prudent move to maintain stability. Other central bankers also eased monetary policy. As the economy recovered, the Fed was slow to react and interest rates were kept lower than they should have been until 2006. In retrospect, we were reminded that central banking is still as much art as it is science. This policy created an easy money environment.

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It also sent a potentially dangerous signal that central banks were likely to act in a manner favourable to investors should market conditions deteriorate. This is in contrast to the doctrine first articulated in the mid-nineteenth century that financial institutions cannot expect to be bailed out if they get into trouble as a result of their actions. This so-called 'moral hazard' is supposed put a brake on foolish behaviour by market participants. Central bankers' actions over the past several years perhaps led to expectations that when markets tremble the central bank will ride into the rescue with easy money. When money is cheap, in plentiful supply, and likely to stay that way, it makes the decision to borrow much easier, and people did. As sure as putting a little seed in a warm, moist Petri dish leads to germination, this easy money is what cast the die for what followed.

3. Trade Imbalances – Transfer massive amounts of liquid assets.

The low interest rate, easy money policies of western governments were amplified by growing trade imbalances between western economies and emerging ones. Massive amounts of money began to flow into China, having become a manufacturing powerhouse, and into oil producing economies as oil prices rose. This resulted in huge amounts of money looking for investment returns and some of it sought a home in western markets. This helped to keep the price of money cheap and provided more juice to allow hedge funds, real estate speculators and

everyone else to use leverage in their investments. The money pot got larger.

4. Asset Appreciation – Buoyant Markets create a Sense of Comfort.

With low interest rates and a growing global economy, assets appreciate. In recent years, stock markets rose in virtually all established markets, and home prices rose significantly in many countries including the US, United Kingdom, Spain and Ireland. As prices rose, momentum built, and collectively the level of comfort with leverage increased as people remembered the old adage "you can't lose money on real estate". So much money was looking for a return that it became a 'seller's market'. The spread between what the most credit worthy borrower could borrow money at versus a less worthy borrower narrowed. Investors began to accept very low premiums for buying riskier debt. Borrowers were able to set the terms of their loans rather than lenders. Leverage rates increased to levels even greater than the 5% margin rates that preceded the crash of 1929.

Eventually the real estate market took on a momentum of its own. While buying a home used to be considered the biggest investment of one's life, now large numbers of people bought homes with the intention of selling them for a profit. One should have suspected something was going on when your work colleague bought three properties in the neighbourhood and seven in Spain! In America, where buying one's own home has always been a key part of the national dream, even people who could not afford it were seduced by the siren song of cheap money. In general, people stopped worrying about downside risk and just focused on the money they could earn using leverage. The 'can't lose' mentality started to set in.

5. Financial Innovation – Creates New Attractive-Looking Investments.

In the pursuit of higher profits beyond what could be earned from underwriting conventional bonds, investment bankers created Collateralized Debt Obligations (CDOs), which are derivatives built out of commercial debt and loans, MBSs and other interest bearing assets. Investors, hungry for higher yields, snapped them up.

CDOs are complex instruments that require complicated models and they are difficult to value. There are many different kinds of CDO structures, and each one contains different assets and payment features. In response to the demand, the financial industry responded with an ever greater number of CDO offerings, and sold them around the world to banks, large and small, and to investors. Some investors borrowed money in the short term money markets at low interest rates to purchase higher yielding CDOs with longer maturities. Again, the focus was on leveraged returns rather than any potential downside risk. As Gordon Gecko might have said, "there's only one thing I want -- more!"

6. Lending Standards are relaxed to the point of the Ridiculous – People borrow money when it's obvious they can't pay it back.

As the momentum in the US home market continued upwards, everyone wanted into the market, and the mortgage business became volume driven. Mortgage originators were paid on volume and financial institutions continued to rely on the packaging and sale of mortgages, both as MBS and CDO structures containing MBS, in order to sustain the level of activity.

The assessment of credit quality was neglected, and in some jurisdictions it was possible for prospective borrowers to "self-declare" their income and borrow more than the value of their homes with no credit checks. As prices rose, more lower-middle-class people were frozen out of the market because they could not afford to make the payments on conventional mortgages. Adjustable rate mortgages (ARMs) came to the rescue, giving those people

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low teaser interest rates for the first two years, before the interest rate, principal amount and their monthly payments leap upwards, creating a foreclosure in waiting.

As it turns out, this deterioration of loan quality wasn't just caused by less sophisticated borrowers getting in over their heads. Unscrupulous operators entered the mortgage business, and created fake credit histories and other documents on behalf of unsuspecting borrowers. That resulted in loans being made to people who really had no remote possibility of getting a loan in a rational system. A problem that was originally just the result of faulty lending practices was amplified by what could turn out to be a massive series of frauds. A raft of mortgages was created that could only stay afloat long enough to become waterlogged in default. Perhaps tighter consumer mortgage regulations in some jurisdictions could have reduced the amount of larceny going on, but it is important to remember that rules alone cannot prevent outright fraud.

7. Ratings Agencies and their clients rely on Models from 'Normal' times.

Ratings agencies applied credit ratings to CDO structures using their traditional models that worked well historically during more normal times. The agencies assigned credit ratings to CDOs that looked similar to the ratings given to corporate or government bonds; ratings such as AAA or AA. However, the evaluation of the two different types of debt is performed differently. Corporate debt and government debt is generally rated based on detailed fundamental analysis. For example, a rating of the debt of a local telephone company would involve the analysis of the company's financial statements, the growth outlook in the company's service area, competitive threats, company growth forecasts, and so on. However, for CDOs the procedures followed were (and still are) different. As the risk is more diversified, the fundamental analysis is less stringent and instead the cornerstone of the rating is based on statistical models.

These models have a track record based on historical performance, which in turn meant that they failed to take into account structural changes in both the underlying assets – in particular, the relaxation of lending criteria – and also the financial markets in which the assets are trading. Here, participants are building up similar, and thus less diversified, portfolios. At the same time, a rather subtle point (that rating agencies only ever seek to provide relative, rather than absolute, opinions on risk) faded from the collective consciousness of the market. Participants in the market forgot the original purpose of the ratings and began to use them in ways that were never intended. If you only have a hammer, everything starts to look like a nail.

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8. Investors become Complacent – Greed triumphs Fear – "Fear, what Fear?"

As the momentum built, and after a long period of no major market mishaps or corrections, many investors became complacent, and stopped really examining what they were buying. In turn, presented with a marketplace full of investors hungry for assets, bond issuers took advantage of the situation

and borrowed money on increasingly favourable terms. Disclosure documents, containing the conditions of loans, MBSs, CDOs and so on, started to contain terms that gave incredible flexibility to the borrower, with statements in some cases such as 'and 20% of other [i.e. undisclosed!] assets'. One of the most expensive sentences in the financial world, "It's different this time", made a reappearance, with the sentiment pervading analyst's reports and crossing into mainstream commentary. Clearly, investors took their eye off the ball, and focused almost completely on returns, with downside risk often totally neglected.

9. Institutions Create Structured Investment Vehicles and Conduits - People Lose Track of Who Owns What.

One notable example of financial innovation is that of the SIV, or Structured Investment Vehicle, and its close relative, the Conduit. Essentially, the motivation behind both of these entities was the same – leverage. The basic business model is simple; fund part of the vehicle with a small amount of equity and sell short dated bonds, termed ABCP or Asset Backed Commercial Paper on a rolling basis, say every three months, for the rest. Then use the money to purchase long dated risky assets, often themselves structured securities such as MBS and CDO tranches.

Fundamentally, there is nothing wrong with this procedure. After all, this technique is essentially a cut-down version of what any bank does. The ability of the SIVs to raise funds was assisted by the rating agencies. Their analysis of the vehicle's business model, coupled with the provision of some form of liquidity backstop from a financial institution, enabled them to opine on the quality of the vehicle and thus place a rating (often a high one such as A, AA or even AAA) on the ABCP issued by the vehicles. This rating, along with the insurance provided by the liquidity backstop, (which is essentially an obligation of some third party to fund the vehicle should investors no longer wish to purchase the ABCP), meant that there was no shortage of investors willing to purchase the ABCP and earn a higher return than what was available from other assets with a similar rating.

On the other hand, there was a shortage of detailed analysis of what exactly the risks were for either the bank selling the liquidity backstop, or for the equity investors. Often, these were the same people. To further muddy the waters, some of the assets purchased by the vehicles were structured by, and occasionally purchased directly from, the same people. In other words, assets moved from the balance sheets of institutions to the balance sheets of the vehicles, with the resultant loss of transparency to investors. To further compound the problem, the models used by the rating agencies suffered from the same issues of applicability and interpretation as those used for rating other structured products.

The net result was the growth of an industry that allowed financial institutions to park assets off their balance sheets, in a vehicle that essentially operated as a bank, but without the benefits of regulation or a central bank in the background to maintain orderly affairs. At the same time, investors were prepared to lend money to these vehicles without carefully considering the risks involved.

10. People start to worry about being paid back – holders of capital go on strike.

Eventually, the continuous stream of good news started to dry up. The financial markets hate a vacuum, and when the good news dries up, it is inevitably replaced with bad news and rumours,

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fuelling fear and insecurity. The recent credit crunch was no exception to this. Some investors started to realize that they didn't really know what they owned. They also realized that those in the banking business didn't know what other bankers owned. Confidence rapidly eroded. Lack of information caused trust to erode. Bankers quit lending to bankers. Investors ceased buying the asset backed commercial paper that was being used to hold the CDOs. This led, in the first instance, to the liquidity crisis that the financial system finds itself in today, and secondly to the first critical examination of the assets underlying billions of dollars worth of investments.

Conclusions

The world of finance is a complex system. Derivatives lie at the frontier of finance, constantly pushing the boundaries of what is possible. They generate innovation that leads to new leaps ahead, enabling capital to be allocated more efficiently, providing access to capital for those who could not get it before, and holding out the promise of increasing the returns of the pension funds that millions of people depend on. But, like any activity occurring out at the edge of current knowledge, sometimes there are unintended consequences. That is what happened in 2007.

Given the scale of recent events, any observer could hardly be blamed for asking the questions posed at the beginning of this article - 'how did this happen; how can we resolve it; and how can we prevent it from happening again?' This commentary has so far discussed the first question, and we now turn to the second and third parts.

Clearly, there is little one can do about the basic human emotions of fear and greed. However, as active participants in the field of modeling, pricing, and risk analysis of derivatives trades, we are in a position to opine on the use, and misuse, of quantitative models and data. It is clear that a lot of faith was placed in the output of a limited range of models, and also that this output was not always interpreted correctly. Therefore, market participants should look to both widen the range of pricing models used for the analysis of derivatives trades, and also treat the output of such models for what it is – simply, just the result of some calculation in some model. No single model can credibly claim to provide a complete picture. Instead, any trade should be examined using multiple models. Often, while the 'latest-and-greatest' model might well provide the most detail available, extra insight can be obtained using a range of models. Also one tends to find that older models, may be less sophisticated but with fewer subtle features, are useful in this respect.

At the same time, it is also important that the output of models and other quantitative processes is treated appropriately, and in particular viewed with a critical eye. For example, while many have expressed surprise at the rapid decline of some assets from 'AAA' ratings to near-default junk status (and it would indeed to be fair to say that both the number and size of downgrades has been exceptional), it has to be noted that rating agencies have only ever claimed that their opinions are measures of relative default risk. In other words, assets rated 'AAA' should default less than those rated 'AA', and so on. This is not the same as either positing a rate of default for each grade, or claiming that obligations of a certain rating are risk-free. We are certainly not trying to defend or otherwise justify the large number of recent downgrades. In our opinion the providers of ratings have probably been as 'irrationally exuberant' as everyone else, but it is fair to say that many users of ratings probably

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failed to appreciate this point.

This is not the first time that the derivatives market has been thrown into disarray and it may well not be the last. About twenty years ago it almost died when an English municipality ran into financial trouble. The local council had entered into a series of derivatives contracts with some banks. Some of the contracts had earned a profit for the council, but it also lost money on some contracts with those same banks. It tried to collect its profits from the banks but walk away from its losses. This called into question the very validity of those contracts and it could have killed in its infancy what has become the $150 trillion interest rate swaps market. The financial industry responded back then with the right strategy to fix that unintended consequence, by agreeing to use a clear, understandable standard-form of agreement with rules in place to deal with situations like the one that arose in England. The market recovered quickly and thrived.

The stakeholders in the market today must take similar steps.

Recommendations

1. Central Banks need to help - Clearly, it is up to the central banks to take the appropriate action to steer the global financial markets out of their current situation, and they have started to do so. The US Federal Reserve Board has cut its benchmark rate in an attempt to make it easier for banks to fund their activities. However, as the Japanese demonstrated in the early 1990's, when interest rates were lowered to essentially zero, this still did not stimulate the market. Central bankers can only mitigate conditions; they cannot reverse them. Recent steps taken by five of the major central banks in concert will make it easier for bankers to borrow cash. These steps include loosening collateral requirements and making more money available will help more than cutting interest rates. But the cash being made available is only enough to help the most desperate and is, in some respects, just another confidence building exercise, albeit an important symbolic step.

This is not the first time in recent history that central bankers have resorted to 'turning on the taps' of liquidity in an attempt to alleviate problems, and it is undoubtedly not the last. Many, including ourselves, have observed that frequent recourse to this action has instilled a level of complacency into the market, and that the comfort blanket that this provides has reduced the sensitivity of market participants to downside risks. We call upon the central banks and their political masters, and in particular the US administration, to avoid the temptation of extending this approach to the retail sector, and in particular to resist imposing rule changes on mortgage deals. Otherwise, there is a real risk that yet more people will disregard the risks involved with financial activities – in other words, do not eliminate moral hazard for the masses.

2. Amend Rules to Deter Reckless Behavior - It is also up to the various regulators and other authorities to identify and deal with inappropriate and reckless behavior, and to amend their rules to prevent reoccurrences. While it is unlikely that bankers will make the same mistake anytime soon, it would be foolish for the authorities not to make rule changes that will prevent banks from moving assets and liabilities so aggressively out of the purview of regulators. In retrospect it is easy to see that the gains made by bankers who moved assets and liabilities off their balance sheets into these vehicles and out of view, while at the same time still providing liquidity guarantees, were only illusory and temporary.

3. Ensure Greater Transparency - Recent moves by some banks to bring SIVs back onto their balance sheets and refinance them (as HSBC and Citigroup have announced recently) should presage more of the same across the industry along with further consolidation; a necessary move to restore transparency to the markets. The entire industry must act to bolster confidence

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by ensuring far greater transparency going forward.

This means that not only must information be provided, but also that the industry must take care to ensure that all market participants are in a position to fully comprehend it, and further, to be able to make rational decisions based upon it. In particular, we call upon market participants to:

1. Provide clear, standardized contracts for all derivatives trades with full disclosure.

2. Ensure that the appropriate tools for valuing and assessing the risk on trades are available to all stakeholders.

3. View models as an imperfect lens, use them with a level of 'healthy skepticism', and ensure that a suitable set of models are used instead of over reliance on a single model.

Rest assured that in the midst of all this hubbub, yet another large transfer of wealth is underway. While some bank shareholders continue to watch their equity erode as write-off follows write-off, other investors are already prospecting for under-priced assets and accumulating them at bargain prices. This is yet another reminder that one person's junk can become someone else's treasure.

4. Understand the Ratings - Finally, investors can no longer rely on simple labels and pat phrases to pick their investments. Overconfidence in, and to some extent a lack of understanding of the true meaning of ratings such as "AAA", must be supplanted with more critical analysis. The use of those ratings, in hindsight, provided lazy investors with a false sense of safety. The harsh lessons learnt from recent events are stinging right now, but the memory of them will fade. It will likely take another twenty years for similar fundamental mistakes to happen again. But they most surely will.