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Sub-Prime Armageddon – The State of the Market Surveyed

The recent market turmoil has been unprecedented in terms of its nature and voracity. Ben Bernanke has recently stepped in and aggressively cut US rates by 50bps in an attempt to head off recession and calm markets. The future remains unclear. Given easy money has been the cause of the problem should easy money also provide the solution or are we just prolonging the inevitable post party hangover! In this Five Oceans Thought Piece, we examine the background to what has occurred, the anatomy of the crisis and contemplate the future.

The Background

Over the past 20 years the interaction of productivity enhancements at an operational level, interacting with the accessing of under utilised resources in Asia, has produced;

- low inflation,
- high profits, and
- a surge in 'surplus savings'.

Central banks in the West, and most significantly in Japan, maintained low short-term interest rates for extended periods over the early part of this decade. This was both a response to the deflationary concerns raised by the 2001 tech bust, and September 11, with the positive disinflation impact of globalisation and new technology. Those structural changes in the global economy were seen as permitting higher rates of growth without triggering inflation. This led to a relaxing of what is termed the Taylor rule, whereby central banks raised rates as capacity utilisation rates rose to head off the risk of inflation.

With the strength of corporate profitability, and a much more disciplined approach to capital investment, there has been a decline in demand for borrowing from this traditional corporate customer base. Due to that decline, the financial sector has refocused on other sources of credit demand;

- the household sector, primarily through mortgages,
- the financial sector itself, providing leverage to hedge funds,
- private equity driven Leveraged Buy-Outs (LBO's),
- off balance sheet structures providing additional leverage to the financial institutions themselves. These are termed conduits, or Structured Investment Vehicles (SIV's).

This surplus savings environment has produced a few other interesting developments.

1. The decline in stock market volatility

A steadily rising market means that there is less of a difference between winners and losers. 'A rising tide lifts all boats!'

Declining volatility means that even though returns are declining, risk models applied by banks' risk officers, to determine the amount of capital that can be put at risk by banks proprietary trading desks, and allocations to hedge funds, permit increasing allocations of capital.

This situation facilitates the maintaining of returns with the impression that risk still sits within safe levels.

This is one of the dimensions of the Quantitative modeling paradigm where past associations are used to model for the future with the resulting risk that these associations break down, which is what has been happening through the September Quarter in a spectacular way.

Traditionally credit market problems have been anticipated by the equity market. In this instance that did not happen. The equity market has proved relatively resilient thus far to the issues in the credit market. This of itself has created a wide range of problems. It meant one of the classic flags of risk to the debt markets did not operate. It also begs the question, why have equity markets been so resilient in the face of the enormous stress shown in the credit markets.

2. Correlation coefficients may become distorted

Liquidity drives correlation. Quant funds using similar modeling algorithms all end up trading in a similar way. Some of these trades eke out limited returns based on the differentials between the returns on two assets, and then increase them to reasonable levels by the application of gearing. Furthermore, as

these investment strategies are in many instances 'market neutral' with a long position in one asset being offset by a short position in another asset, the investor is shown that under normal circumstances market risk is low. Normal circumstances are characterised with reference to historic statistical distributions. In simplistic terms a 95% probability under a normal statistical distribution is measured as encompassing 'two standard deviations' which is the basis for the calculation of VAR (value at risk) one of the primary risk measures used by the investment banking and management industries.

3. The decline in credit risk premia

Falling risk free rates, leave funds looking at more risky investments to sustain returns. Those risks are in part 'justified' by the lower volatility described above. Investors hence bid up the price of low quality assets narrowing the implied risk spread between them and high quality assets. This is to an extent what has happened with local councils in Australia with drastic consequences. They have chased additional yield from investments, (Collateralised Debt Obligations – CDO's), that they obviously did not fully understand, and that additionally did not reflect the correct risk reward profile for them.

Changes in the Macro Environment

There have also been a number of changes in the macro environment causing a shift in the financial markets and the manner in which data can be interpreted.

1. Rates rise

As concerns about the sustainability of the domestic economies against a strong global economy declined, central banks commenced increasing interest rates to remove the stimulatory impact. Rates were to be returned to 'normal' or neutral levels.

However the US process was delayed by the impact of Hurricane Katrina. It appears that the US Federal Reserve (Fed) may have been politically constrained in raising rates as quickly as it would have liked at a time when the national focus was on assisting the reconstruction of the devastated regions in the Gulf of Mexico.

2. Inflationary Risk Reappears

Levels of inflationary risk have also risen driven by the following:

- Commodity prices and most specifically energy price rises
- Food prices reflecting a collection of factors; environmental, and the substitution of certain grains from food production to ethanol production
- The decline in the disinflationary impact of Chinese exports as production started reaching capacity constraints in some areas. This reflected stated Chinese economic policy to reduce excessive investment, and a rise in the Chinese exchange rate.

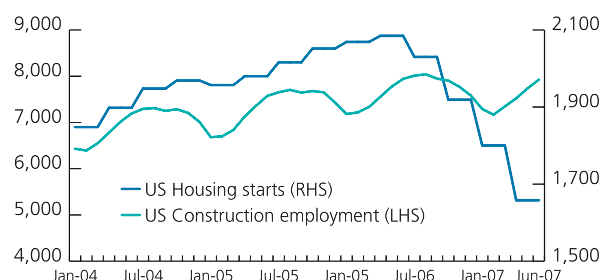
Employment in many parts of the world remains at or near structural highs. Commodity price rises and increasing constraints upon Chinese capacity has led to renewed talk by central banks as to the application of the Taylor rule. Note the 'jury is out' on whether the disinflationary effect of Asia has yet played out. Further productivity driven enhancements to production are expected from China and India. However the immediate pressure is on the upside.

Inflation in China has risen sharply over the past 6 months, driven by a dramatic rise in food prices. This has been driven by a disease having a marked impact on pork production, a Chinese staple, and higher grain prices. The Chinese have been also steadily raising interest rates in conjunction with banking reserve ratios, though they still are not at a level to represent a significant drag on the economy.

3. Forces decelerating the US and Global Economy

The initial impact of these rate increases was a slowdown in new US residential construction at the beginning of 2006.

Construction employment vs housing starts



Furthermore, high oil prices represent a drag on consumption, though remarkably, consumption whilst anaemic has held up so far.

Employment resilience has been a key driver. Even in construction, employment falls have been modest. This reflects a hidden job loss, as the initial shedding of staff was probably primarily focused on illegal immigrants employed off the books. Estimates suggest that some 500,000 jobs have been already shed here, but those jobs may have been found elsewhere in the economy given tight labour market conditions. We just don't know.

Outside of the US growth continues to be driven by the stimulus coming from the redevelopment of Asia and Eastern Europe. High oil prices, for example, may detract from US growth, but they are a direct stimulus to other parts of the world, not just the Middle East.

Russia, and increasingly Brazil, are benefiting from tight energy markets. European exports to Eastern Europe and the former Soviet Union are now on a par to exports to the US. The impact of China and commodity prices has been a major stimulus to countries like Brazil.

This is the next stage of globalisation whereby the new question is does it matter if the US economy slows down? The US is no longer the sole driver of world growth.

Of course the answer to that question is 'how much the US slows'. It is a matter of degree. The forces driving a US slowdown prior to the current credit crisis were mitigated by the positive effect of global growth and strong corporate balance sheets. The market consensus firmly believed that the sub-prime crisis would not lead to a more serious downturn in the US.

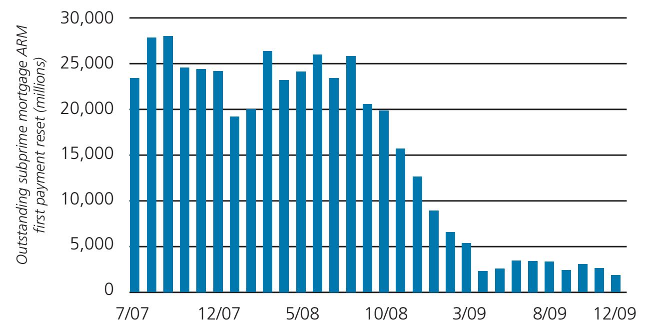
The problem unsurprisingly is that it is the second order effects of the housing slowdown, more than the initial impact, that risk producing a more serious slowdown in the US.

4. Rising defaults

The impact of increasing interest rates has produced a rise in defaults in sub-prime loans. This has been accentuated as teaser rates roll off, meaning that borrowers are being hit by extreme shifts in interest costs. Sub-prime borrowers are not showing the same reticence to give up their homes as traditional borrowers with home mortgages.

This situation is likely to get worse before it gets better.

Figure 2: A wave of resets for subprime mortgage borrowers will continue into 2009; in many cases precipitating default and foreclosuures for the subsequent 2 or 3 years



Source: Deutsche Bank

5. The impact of securitisation

In the traditional financial system banks would both originate loans, and carry them on their balance sheets. Sub-prime loans, however, have not been carried on the balance sheets of the originators. Now they are securitised by the banks and in part, though not totally, sold on to third parties.

Those securities are packaged into bundles in order to 'diversify' risk. The risk characteristic of the package is vouched for by credit rating agencies.

What is becoming increasingly apparent is that the securitisation process reduces transparency as to the underlying credit risk of some of the constituents of those packages. That loss of transparency was seen to be addressed by the analysis of the credit agencies.

Furthermore some of the underlying instruments forming parts of those securities have proved to be highly illiquid.

In the absence of confidence in the transparency and valuation of these securities, problems in a narrow group of assets have been able to spread across a broad range of securities, contaminating a much greater part of the system. Confidence becomes fundamental. There are some ironies here. Aggregate bad debt may in fact be small, and the diversified bundles may indeed have relatively low credit risk but in the absence of confidence and full knowledge, investors may not feel comfortable with the make-up of the underlying exposures of those securitizations.

As a result, whilst credit risk may be more broadly spread across these diversified bundles, in the absence of confidence prospective buyers may still shun them leading to a credit crunch.

Ownership of these securities

Securitised sub-prime loans have been sold to a number of investors;

1. Hedge funds and professional investors
2. Pension funds and other broad investment vehicles
3. Conduits: Structured Investment Vehicles (SIV's)

1. Hedge funds and professional Investors

Hedge funds can and do own a variety of these securities. The most risky portion of those securities involves the residual, or equity tranches in structured finance deals.

Notwithstanding the low risk bundles of these securities may be sold to less experienced parts of the market, the higher risk instruments tended to be the preserve of investors who felt themselves better able to manage the risk; i.e. the hedge funds and the proprietary trading desks of the large banks.

The large banks could also be exposed to moral hazard, in that as originators of the securitisation programs, under certain market circumstances; they would be incentivised, or obligated, to also carry some of the higher risk tranches in those programmes.

Those risks might have been offset by other countervailing investments used as insurance. Those investments would be again suggested by the use of historical statistical correlation models. The sell off in sub-prime exposed that risk. Some of the offsetting insurance/shorts failed to generate compensating returns as certain historical correlations failed to materialise.

Additionally, however there were issues as to whether some of these underlying securities were being accurately priced. A portion of them do not have liquid markets. In the absence of a market price they can be valued by use of a computer model. This valuation however may prove arbitrary, and next to useless as a reflection of the true resale value of the security.

While some securities used as insurance offsets failed to materialise, more damage was done as a loss of investor confidence in the underlying securities caused the secondary market to evaporate in some of these assets, meaning they could not be priced, and in the face of any prospective redemption of investors they cannot be liquidated.

This generated the Bear Stearns crisis where in June they pledged a collateralized loan of up to $3.2 billion to 'bail out' one of their Hedge Funds, the Bear Stearns High-Grade Structured Credit Fund, while negotiating with other banks to loan money against collateral in another fund, the Bear Stearns High-Grade Structured Credit Enhanced Leveraged Fund. Their funds were invested in thinly traded collateralised debt obligations (CDO's) found to be worth significantly less than their mark-to-model value.

One of the involved parties, Merrill Lynch, seized collateral totaling $850 million worth of underlying securities but managed to auction only $100 million of them, due to illiquidity in these markets. The incident then sparked concern of contagion given fears that Bear Stearns would be forced to liquidate its CDOs, prompting a major mark-down of similar assets in other portfolios. During July, Bear Stearns disclosed that the two sub-prime hedge funds had lost nearly all of their value amid a rapid decline in the market for sub-prime mortgages.

2. Pension funds and other broad investment vehicles

More traditional investors, such as pension funds, were also buyers of the less risky tranches of these securitizations. These were not so much the riskier residuals, but rather the rated broad pools.

Even if these funds were not exposed to sub-prime there is still some evidence that there may have been mis-pricing risk at the margin. It appears that in some cases that the rating agencies may have been conflicted in their assessment of these securities as they both rated them, and advised the investment banks as to how they should be manufactured.

The hit to investor confidence has led to a 'buyers strike' in the commercial paper market, despite the enormous pool of 'surplus savings' which again exacerbated liquidity issues in the market.

3. Conduits: SIV's and the horizontal 'transmission mechanism'

A range of financial institutions, some of whom originated these loans, but a number whom did not, established a new form of holding structure to hold these securities. On one level these conduits can be seen as intermediaries between the origination of the loans, and their on-sale to third parties. These conduits would ultimately on sell part of the securities, though a portion could be carried. These conduits would fund the carrying of these securities by way of the sale of commercial paper backed by their holdings. This is termed Asset Backed Commercial Paper (ABCP). This is yet another form of pooled security, a market

whose size is significantly larger than the sub-prime debt market.

The debt carried by the conduits does not just include sub-prime and prime mortgage assets of credit ratings ranging from junk to AAA (termed - Collatoralised Debt Obligations (CDO's)), they could also carry securitised loans to the corporate sector (termed - Collatoralised Loan Obligations – (CLO's)). Whilst traditional corporate borrowing remained relatively subdued, a significant amount of demand derived from leveraged buyouts (LBO's) by private equity firms.

Funding of these deals was done by way of the sale of these loans directly and indirectly via CLO's to investors, either directly or through the intermediary of SIV's. In the hands of the SIV's these loans might be further pooled with CDO's carrying mortgage debt. Through this maze it is clear how complex and intermingled this debt is. A crisis of confidence in some portion risked contaminating a far larger pool.

More significant however is the contamination of other investment securities that has taken place as an indirect effect of the sub-prime crisis. The risk premium on a broad range of securities has risen. This means that investors who were assured their holdings had low exposure may have higher risk of loss even if they don't hold sub-prime exposure. The economic effects of a risk repricing along the quality spectrum has yet to play out.

The deterioration in sub-prime coincided with a massive issuance of hi-yield securities to fund the LBO deal boom. That debt was priced very aggressively. Risk spreads were cut to the bone. Investors found themselves reluctant to buy this paper as risk spreads started deteriorating in the asset backed commercial paper market, in mortgage based CDO's, and the credit default swap market (CDS). At the same time the pricing of these instruments started to deteriorate. This spilled over into the hi-yield market, the funding source for the LBO transactions. Deals were pulled, leaving some of the major banks, as underwriters of these transactions having to carry those deals on their balance sheets through bridging finance.

This saw the large banks now exposed to the problems in the credit market.

This phenomenon is what the Fed has referred to as horizontal transmission. The Fed has wanted a normalisation of risk spreads, though the question as to what is normal is a moot point. It was also concerned that the sub-prime crisis could trigger a repricing of all risk. This would be done not necessarily by way of vertical transmission, that is direct exposure to sub-prime debt, but through the indirect impact of increasing opportunity cost of carrying risk on one end of the asset spectrum raising the pricing of all risk.

Furthermore, as hedge funds and SIV's faced risks of redemptions and inability to raise funding by selling commercial paper, there was a desperate selling of higher quality paper, dumping it on the market in order to raise liquidity.

The effect on hi-yield was not just through repricing. Demand would be impacted by the hit to the Structured Investment Vehicles who were buyers of both CDO's and CLO's.

SIV problems hit the banking sector

Most concerning, however, has been the use of SIV's by banks to both facilitate the origination of these deals, but more seriously, to give themselves off-balance sheet leverage to boost returns to equity.

The public story of the banks is that securitisation has reduced balance sheet risk, raising the quality of bank earnings. This leaves the major banks still exposed to potential deterioration in fee income as origination potentially declines. They are also exposed by way of the activities of proprietary trading desks, and the funding of hedge funds.

What has become apparent, however, is that some small banks have used these vehicles to boost their lending books beyond the scale that was prudent for their balance sheets. This is what hit some of the smaller German banks. More seriously still, are the SIV's carried by the large banks, masking large exposures. As a result of this the true exposure of the banks is unclear. Those problems have reached a scale where the banks are now hesitant in lending to each other.

The Resultant Fall-out

1. Credit Crunch

This has triggered a major credit crunch. Not only has the commercial paper market dried up, the inter bank market is going through major stress in some geographies. Jean-Claude Trichet, the head of the European Central Bank, commented that the problem was the lack of transparency.

This has forced the central banks to step in to shore up liquidity in financial markets. What is unclear, however is how this intervention restores bank confidence in each other, in commercial paper, in a whole structure that is built on many levels of dis-intermediation, in which certainty is limited as to the strength of any link in the chain. An initial impression is that credit origination will move back on balance sheet, or that

transparency will need to rise markedly. But how do we get there from here? Will interest rate moves be enough?

Josef Ackermann, the CEO of Deutsche Bank said in a statement on the 5th September this year, that was characterised by the financial press as 'remarkable', that the banks had to come clean about their exposures and take the necessary write offs in order to restore confidence.

2. Increasing risk premia challenges the carry trade

This also applies to what were formally seen as relatively low risk trades as seen in the 'carry trade'. Here a variety of investors, from hedge funds to retail investors, sought to borrow at low interest rates in one currency to buy assets with high returns in another currency. We saw this in the hit to the Australian dollar (target currency), and the rally in the Yen (funding currency) during August this year when the Australian dollar fell 15% versus the yen in a matter of days.

3. Interest rates rising

The increase in credit risk premiums represented a defacto rate rise of 100bp through July and August. In the US, where the economy was slowing, this rate rise adds to the negative economic pressure. Although since Ben Bernanke instigated his own version of the 'Greenspan Put' in September, by cutting US rates by 0.50%, markets have normalized, at least for the time being!

(see: Five Oceans Thought Piece, Economic Management and Monetary Dilemmas, http://www.5oam.com/download/ThoughtPieceIssue2.pdf)

4. Supply of credit to fall

Credit lending standards are tightening. We are beginning to see a decline in lending that will have a further negative impact, particularly on the US and UK economies. This trend will blunt the immediacy of central bank easing, in a reversal of the 'central bank tightening vs lending standards loosening' phenomenon of the 2006-07 period.

5. Impact on House Prices

US housing prices are now falling. The size of the prospective fall is widely debated. There is a vast range of forecasts. Up until a month ago many forecasts sat between -3% to 5% in one year, -12% to 20% over 3 years. Some more extreme models, based on the deviation between home prices and rental yields are suggesting falls of 50%, over an undefined period. This seems extreme. But at the US Federal Bank Jackson Hole conference in early September the risk of these falls was widely debated.

6. The risk to US consumption

As is always the way in times of crisis, and there is no question that this is a crisis, some of the longer-term structural debates return to the forefront.

One of the grand disputes sits around the sustainability of US consumption levels. Bears suggest that consumption spending is driven by unsustainable levels of debt. This question will not be addressed in this form in this paper, but there are more immediate questions.

What will be the impact of a fall in US home prices on consumption? How much is consumer spending power directly attributable to a change in house prices? This refers to the question of Mortgage Equity Withdrawal whereby households benefited from the refinancing of home loans at lower rates. Alternatively to what extent is consumer confidence a function of house prices? Or asset prices generally? The upper middle class and above is less exposed to increased interest rates, but much more exposed to falling asset prices. Furthermore job losses are now entering the financial services sector.

7. Mid cycle slowdown in the US to become more severe

Whilst we cannot forecast the exact consequences, it is highly likely that the US mid cycle slow down will be more severe.

Tighter credit standards could exacerbate the housing downturn and result in a more pronounced decline than is expected.

8. Central Banks are worried about moral hazard

Inflationary risks have been building in economies close to full employment. The question 'are we reaching the end of the 'disinflation era" remains profound.

A low risk premium is a driver of asset inflation, and the expansion of broad money. The central banks have seen in Japan in the late 80's the risks posed by an asset bubble to the integrity of an economy.

But the correction process poses risks that no doubt are being currently debated within the Fed. Can/should the central bank seek to underwrite property prices? Can central banks

manage/supervise a correction process, whilst preventing systemic risks undermining the structural integrity of the economy? Again this was debated at Jackson Hole by the US Federal Reserve.

Bears will argue that the system is already structurally compromised and a failure to allow the correction will ultimately add further fuel to those structural weaknesses. This argument would suggest that we are addicted to cheap money, but the detox may be too painful politically and economically to permit. But how do you increase the risk premium? You have to permit pain. An institution has to suffer, if not fail, without it threatening the integrity of the system. There's got to be a 'body'!

Will the behavior of financial institutions change if some senior management figures do not suffer serious consequences from this blow up? This is very much aligned with the criticism of corporate capitalism that individual decision makers can disassociate themselves from the success or failure of the company. A company failing does not necessarily mean a change in individual behavior if there are not individual consequences. Contrary to the way companies are subliminally portrayed, they are not living sentient beings.

Should Central Banks reduce the certainty or clarity as to the nature of their intervention? The Bundesbank famously in the 80's and early 90's made a point of being occasionally somewhat enigmatic. This is consistent with rational expectations theory, whereby policy if too predictable is ineffective, and builds moral hazard.

9. This risk means the market now expect/are dependent on interest rate cuts!

Whilst the Fed is concerned about the moral hazard, and it is unclear how the US economy will be impacted by sub-prime, with Bernanke's position characterised as 'data dependant', the markets have said 'no' to the wait and see approach.

The Federal Reserves move to cut rate 0.5% in September has comforted markets and stabilized conditions at least in the short term. Equities markets have responded positively and confidence has rebounded almost to the point where recent events appear as an aberration.

We await more data to determine the extent of the damage and see what further policy adjustments the Fed will make.

What is the normalised risk premium?

Risk premia have risen but Bernanke's recent move to lower interest rates has calmed markets and given participants hope that the good times can continue and risk premia can remain below historic levels. Models suggest that the default rate in many classes still look well below historical levels. In the absence of deterioration in these default rates, the market may deem that risk premia can remain below historical levels.

In classic cycle terms however, low risk premia leads to low interest rates, which normally leads to the funding of more marginal projects. Ultimately, it is this relative deterioration of asset quality that should drive default rates back towards historical levels. The question is can the forces that have kept returns on capital above historic norms and default rates below be sustained?

Only time will tell!

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