

**“Subprime – When risk management fails”**

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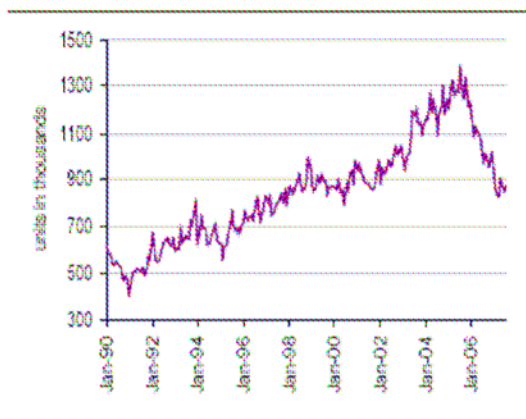
A decade ago, a real estate collapse in Thailand heralded the start of a string of events that led to economic turmoil in all of Asia, reaching as far north as Korea and Taiwan. Speculators suddenly started to notice the scores of unoccupied buildings around Bangkok, sniffed the scent of blood, and the rest, as we know, is history known as the Asian Financial Crisis.

Forward ten years. As the subprime crisis continues to unfold bit by agonizing bit in the US, reverberations are being felt across the world, in not just the mortgage markets, but in different asset sectors with little connection to the subprime sector. As Greenspan opined – ‘Smells familiar’.

**Casualties**

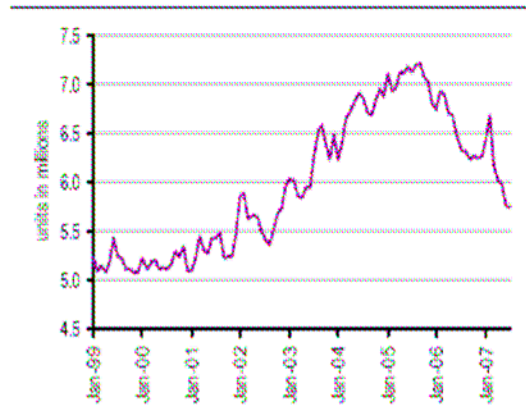
Beginning late 2006, the subprime crisis first hit firms engaged in the mortgage market as a result of a downturn in the housing market (Figs 1 and 2). By 2007, firms such as Countrywide Financial Corporation, which had liquidity issues and had to resort to borrowing \$11.5 billion to be able to make loans, and American Home Mortgage, which filed for bankruptcy, were among a host of mortgage lenders facing problems due to delinquencies (Fig 3).

**Figure 1: New Home Sales Index**



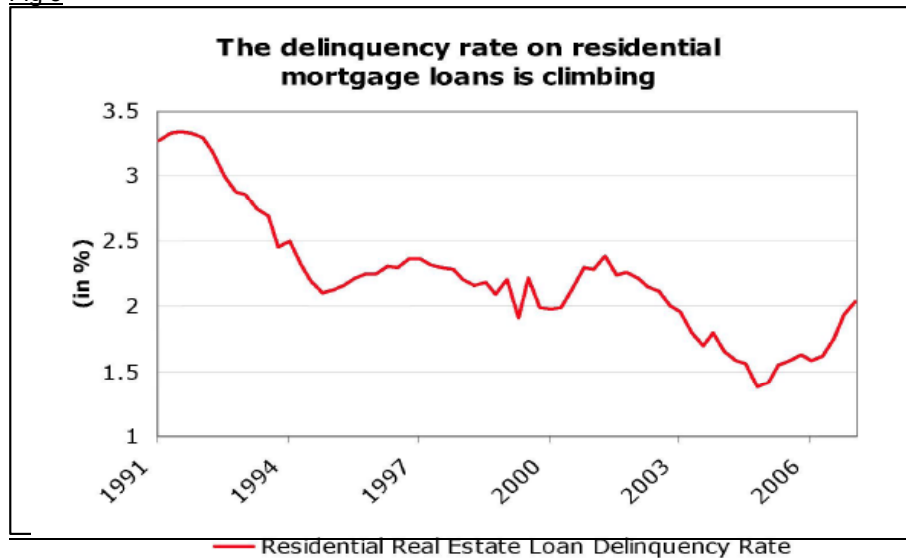
Source: U.S. Census Bureau, Bloomberg

**Figure 2: Existing Home Sales Index**



Source: NAR, Bloomberg

Fig 3



Source: Consolidated Reports of Condition and Income, Federal Financial Institutions Examination Council (FFIEC)

Outside the mortgage market, other sectors were rapidly getting singed. In March 2007, General Motors surprised investors by announcing that earnings plunged 90 per cent during the first quarter of 2007, as a result of losses at its mortgage loan subsidiary General Motors Acceptance Corp (GMAC), losses which overshadowed the 3-year record gains in the core business. In May, UBS decided to shut its Dillon Read Capital Management arm five months after launch, after the hedge fund lost US\$124 million on subprime investments. In June, when Bear Stearns suspended redemptions at two of its hedge funds investing in collateralized debt obligations (CDOs), because its "investment manager believes the company will not have sufficient liquid assets to pay investors" after losing 23 percent of its value in the first four months of the year, creditor Merrill Lynch seized \$800 million worth of the underlying collateral for auction after rejecting a US\$1.5 billion rescue plan from Bear Stearns. The firesale spread fear of contagion in the broader market. The two funds are now essentially worthless.

Ripples were felt outside the United States. In July, German bank IKB Deutsche Industriebank became the first European casualty of the subprime debacle in the United States. IKB had invested a staggering €7.8 billion in the US subprime mortgage market, and faced a potential 45 per cent write-off. It was bailed out by the government. Down under, Macquarie Bank investment fund offshoot, Macquarie Fortress Investment (MFI), reported facing losses of 25 per cent or \$300 million in two of its high yield funds, despite not having any direct investments in subprime mortgages. Instead, with the contagion created as spooked investors fled from the risky high yield sector, the highly-gearred MFI was being punished by association. A 4 per cent loss magnified by six times leverage became a 25 per cent loss. Two other Australian-based hedge funds, Basis Capital and Absolute Capital, which did invest in subprime mortgages, were also hit. Basis Capital halted redemptions in its Yield Alpha Fund and Aust-Rim Opportunity Fund, and later filed for bankruptcy protection for its Basis Yield Alpha Fund, whose assets fell to a quarter of their value from that at the beginning of the year. Later in August, French bank BNP Paribas stopped valuing three of its funds and suspended all withdrawals by investors due to "a complete evaporation of liquidity". The emergence of these losses from subprime investment outside of the US created panic in global asset markets. Bill Gross of Pimco compared the problem confronting investors to a game of 'Where's Waldo' (Waldo being the bad loans and defaulting subprime paper) - "They're all Waldos now".

Other casualties included Goldman Sachs' \$8 billion Global Alpha hedge fund, which reportedly lost 26 per cent in 2007. Citigroup also reported taking \$700 million in losses in its credit business in July and August 2007. Walmart and Home Depot – the US' two largest retailers, also stoked fears of a spreading credit crunch when they reported disappointing earnings and warned that consumer spending was slowing as a result of weakness in the housing sector.

## How it all came about

### *What are subprime loans?*

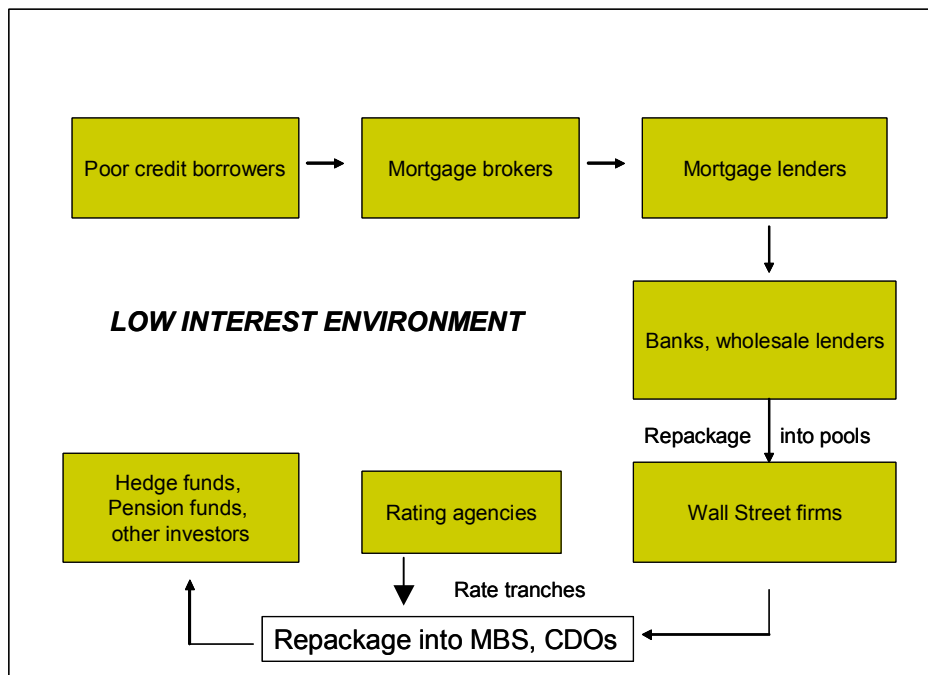
Subprime loans are loans originated to borrowers who do not qualify for market interest rates because of problems in their credit history. Such borrowers are generally considered risky for the lender because they usually have lower incomes and a poor record of repaying debt which increases their default probability. Subprime loans are also risky for borrowers: to offset the risk of default, lenders charge high rates of interest, which are strenuous for borrowers and further increase their likelihood of default.

There are various different types of subprime mortgages including “interest only mortgages” which allow borrowers to only pay interest for a period of time, “pick a payment” which gives the borrower the option on how to repay the loan, and “initial fixed rate mortgages” which convert to variable rate loans like Adjustable Rate Mortgage (ARMs). The 2/28 ARM is the most common, where the rate is fixed for two years, and then reset to equal the value of a rate index at that time, plus a margin. Due to the high margins, the rate on most 2/28s will often rise sharply at the two-year mark, even under normal market conditions.

### *The subprime supply chain*

In the subprime supply chain (Fig 4), poor-credit borrowers take on mortgage loans that are typically 2 per cent higher than rates charged to people with good credit. Mortgage brokers, who match prospective borrowers with lenders, handle approximately 70 per cent of the origination. With the boom in housing, unscrupulous lenders and brokers, who earn by volume, lure borrowers with exotic mortgages such as “no doc” mortgages, which do not require any documentary evidence of income or savings. Big banks and wholesale lenders such as HSBC Holdings buy the debts, repackage them and sell them to Wall Street banks and investment houses, which further repackage these loans into mortgage backed securities (MBS) and collateralized debt obligations (CDO). Rating agencies are pulled in to give a rating to these structured products, which very often yield high rates of return and are sold to pension funds, hedge funds and institutions.

**Figure 4 : The Subprime Supply Chain**



The watch-dog roles of the rating agencies and even the Fed were called into question. The European Union said it planned to examine the agencies' role in the debacle and investigate possible conflicts of interest between the agencies and the issuers of mortgage bonds. In Washington, Representative Barney Frank, the chairman of the House Financial Services Committee, planned hearings in October that would examine this issue. The Fed had also been accused of creating the "perfect storm" by keeping interest rates too low for too long (the Greenspan Put).

#### *Vintage 2005-2006*

Market watchers were worried about these subprime loans originated in 2005-2006, when credit standards were at their most lax, as these would soon see their interest rates begin to rise, forcing up monthly payments for the weakest borrowers practically overnight. Losses for banks and other lenders could reach into the tens of billions (Table 5).

**Table 5: New issuance and expected losses**

Volume in \$Billions				
	Subprime Mortgage Bonds	Mezzanine ABS CDOs	High Grade ABS CDOs	All CDOs
2005	405	27	50	290
2006	477	50	160	468
Y T 8/2007	178	30	70	330

Losses in Percent				
	Subprime Mortgage Bonds	Mezzanine ABS CDOs	High Grade ABS CDOs	
2005	8%	4%	0%	
2006	11.5%	21%	3%	
Y T 8/2007	11%	21%	3%	

Losses in \$Billions				
	Subprime Mortgage Bonds	Mezzanine ABS CDOs	High Grade ABS CDOs	
2005	24	1	0	
2006	55	11	3	
Y T 8/2007	20	8	2	
Total	99	18	4	

Source: UBS

#### *Lax lending rules*

"No Doc" or stated income mortgages, where no proof of income was required, became increasingly used as more borrowers failed to qualify for increasingly costly homes. Originally designed to serve self-employed borrowers and others with difficulties documenting income through traditional means such as pay slips or income tax forms, the "no doc" mortgages were used by mortgage brokers and lenders to bypass qualification standards in order to increase origination volumes. The Mortgage Asset Research Institute (MARI) reported on a sample of 100 stated income loans for which income data, as reported to the Internal Revenue Service, was also available. Among these, nine in 10 involved incomes that were inflated by 5 per cent or more, and almost six in 10 included income figures that had been exaggerated by more than 50 per cent.<sup>1</sup>

"Pick Your Payment" loans, or option adjustable rate mortgages, were also misused. This type of loan allowed borrowers to choose the interest-only payment or the bare minimum payment, during lean times, and large, lump-sum principal payments during better times. Meant for high-net-worth borrowers to maximize interest deductions for tax purposes, or commissioned salespeople with irregular incomes, these

<sup>1</sup> Mortgage Asset Research Institute, *Eighth Periodic Mortgage Fraud Case Report to Mortgage Bankers Association*, April 2006

negatively amortizing loans became broadly distributed in 2003 to people who could not afford such ballooning principal repayments.<sup>2</sup>

#### *Distorted appraisal value*

Home appraisers reported being pressured by a growing number of mortgage originators to give a target value needed in order for the deal to close; otherwise they would be left out of future deals. A 2007 report from the October Research Corp, surveying more than 1200 appraisers, found that 90 per cent of appraisers felt pressured into making false appraisals. Thus buyers bought homes with values inflated by distorted appraisals, while others were encouraged to borrow more on their homes than they were worth.

#### *Securitization shortens the point of view*

In the past, when banks made loans they had to ensure that due diligence was taken, as the loans would remain on their books for a long time. With financial innovations like securitization, the consequence of poor lending decisions became removed from those making the decisions, as the credit risk was offloaded to the market, supposedly to one more able to manage it. Like a hot potato passed from investor to investor, the ultimate credit risk of many home mortgages was no longer borne by originating lenders, but by distant investors with no intimate knowledge of the borrowers. This made for more careless lending practices, as well as greater systemic risk, as the ultimate lenders would have no qualms about running for the door, compared to traditional banks with banking relationships.

Securitization also encouraged greater stress on loan volume rather than loan quality. Rather than interest charged on the loans, lenders' earnings came from origination fees and sale of loans to the secondary market. Mortgage brokers were paid commissions and fees based on loan rate, loan type and loan size, with no responsibility for subsequent delinquency. Investment banks and rating agencies also profited from transaction volume rather than the ultimate performance of those mortgages. Hence, loan quality became a secondary consideration.

#### *CDOs complicates the case*

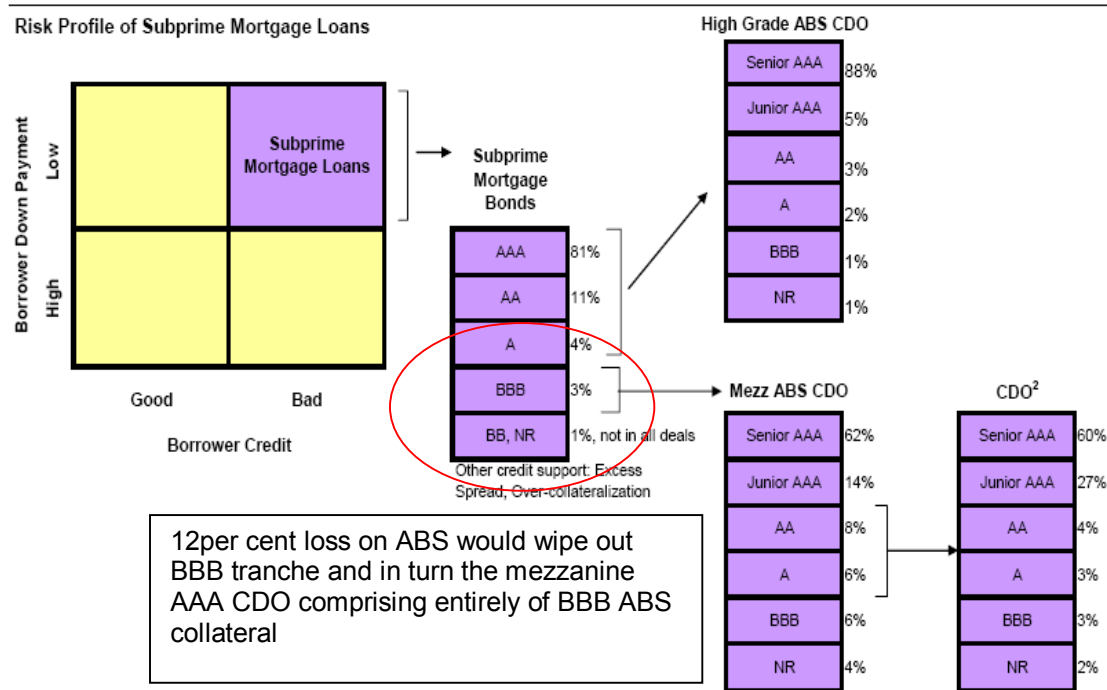
With the growth of the subprime loan market, the income streams from these loans were pooled as collateral and repackaged into home equity loan (HEL) asset-backed securities (ABS). ABSs comprised of different tranches of bonds, with ratings ranging from AAA (low risk) to BBB (middle risk) and the high risk equity tranche. As yield-hungry investors searched for new investment vehicles, ABSs were further repackaged into new securities called collateralized debt obligations (CDOs<sup>[h2]</sup><sup>[h3]</sup>). CDOs pooled assets ranging from investment-grade asset-backed debt to high-yield loans and were tranching into different categories of risk.

There were two types of ABS CDO deals—*mezzanine* and *high grade*. BBB subprime securities were used as collateral for the mezzanine ABS CDO deals, while the AAA, AA and A securities were used as collateral for the high grade ABS CDOs. New creations included collateralized debt obligations of collateralized debt obligations, called CDO-squared. CDO squared were comprised of the A and AA tranches of mezzanine ABS CDO (Fig 6).

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<sup>2</sup> A borrower who pays the minimum payment suffers the added burden of negative amortization as unpaid interest is added to the principal

**Figure 6. Flow chart – Subprime loans, ABS, CDO, CDO<sup>2</sup>**



Source: UBS

AAA tranches of CDOs were given their investment rating by rating agencies due to the supposed diversification from the collateralized subprime loans, as well as subordination of the lower-rated tranches. As a result, the AAA CDOs became highly sought after securities as it was widely believed they represented low risk but were still able to pay yields above comparably rated typical investment grade bonds.

The problem lay with the AAA-rated mezzanine ABS CDOs. The top tranche of the CDO got its AAA rating not because any of the ABS it owned was AAA-rated, but because financial engineering had carved up the cash-flow and payment priority of the underlying assets, and so provided "credit enhancement" to the top tranches. The AAA-piece of the CDO was in fact no more than a senior lien on the payments generated by a large portfolio of BBB-to-B rated tranches of underlying ABS. If the collateral was comprised totally of BBB ABS collateral, and each underlying ABS security had 12 per cent losses, the CDO would be written off entirely (Fig 6).

### From credit risk to credit crunch

Shockwaves spread beyond housing and disrupted global financial markets as investors were forced to re-evaluate the risks they were taking. Consumers also lost the ability to finance further consumer spending, causing increased volatility in the fixed income, equity, and derivative markets. Like in the Asian Crisis, financial market volatility threatened to turn into a full-blown credit crunch as confidence faltered.

#### *Credit for housing dried up*

With the downturn in housing, demand for housing loans fell, as consumers were no longer willing to buy homes. But more importantly, lenders were now obligated to improve their due diligence which meant that many homebuyers who had previously been eligible were not any more. With all the defaults on mortgage-backed bonds, investors were not willing to take the risk of purchasing securities which were exposed to mortgages, resulting in a drastic fall in the supply of credit.

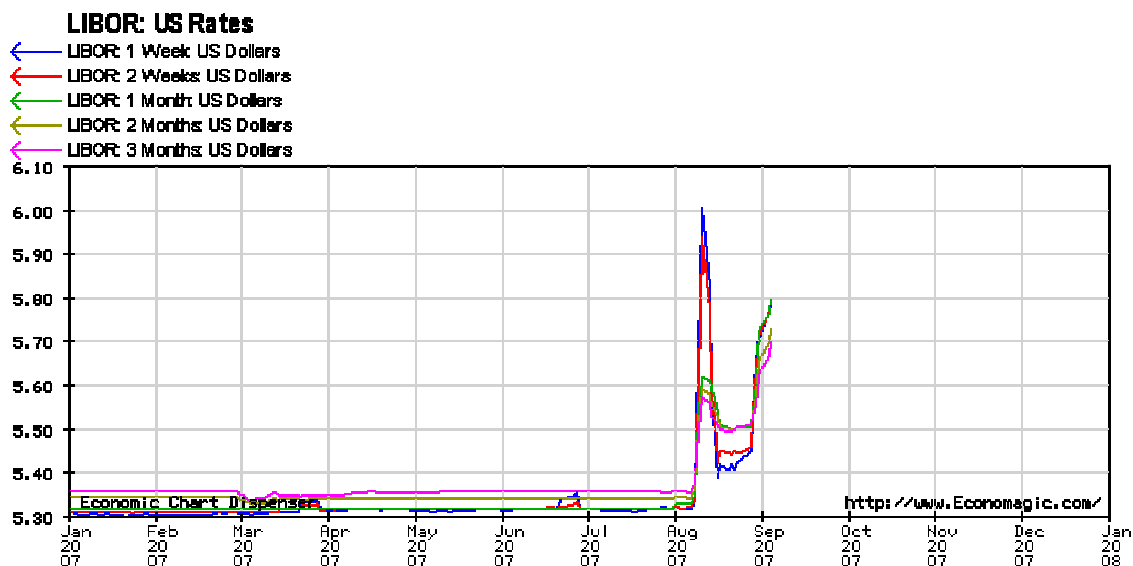
The problem with the credit squeeze was that it was not restricted to the housing market. Borrowers who previously borrowed against their housing equity when house prices were rising – for consumer spending purposes – were now facing negative equity, spreading the contagion to consumer loans, auto loans and credit card loans. Credit was withdrawn sharply from the system, undermining economic growth.

### Flight to quality

In fear of “Waldos”, institutional investors shifted money away from money market funds that held risky corporate debt to funds that invested primarily in ultra safe government-issued securities like treasury bills and bonds. The extreme risk aversion led to even sound companies being hard-pressed to fund their capital needs in the markets, with spreads widening dramatically and maturities shortening as illiquidity in the mortgage market spread to asset-backed commercial paper. The asset-backed commercial paper market was now partially shut, with many unable to get funding and others only able to get it for a week at a time, where previously they might have obtained 30- or 60-day loans.

Confidence was so shaken that even the inter-bank money market was affected, as banks began to view each other with suspicion, fearing that money lent might not be repaid if the bank went under due to subprime problems, and similarly lacking confidence that other banks would trust them if they wanted to borrow. This pushed interbank rates sharply higher in August (Chart 7), and the European Central Bank, the Fed and other central banks had to inject US\$154 billion into their systems on August 9, and US\$135.7 billion on August 10 to cool a mounting credit crunch.<sup>3</sup> Importantly, on Friday August 10, the Fed accepted mortgage-backed securities as collateral for the entirety of the \$35 billion in repos it engaged in that day, trying to stem the confidence crisis in mortgage-backed securities. The Fed and the ECB continued injecting liquidity periodically throughout August and September. In addition, on August 17, the Federal Reserve cut the discount rate by half a percent to 5.75 per cent from 6.25 per cent, while leaving the federal funds rate unchanged, playing its role of lender of last resort. The lower discount rate provided short-term relief to lenders, and firms like Citigroup, JPMorgan Chase, Bank of America, and Wachovia each borrowed \$500 million from the Federal Reserve discount window as an act of faith in the system. Rising costs of funding still remained a problem for banks, however.

Chart 7: Spike in inter-bank rates due to credit crunch



### End of the “Covenant-Lite” times

In early 2007, Standard & Poor’s Leveraged Commentary & Data reported that covenant-lite loan volume climbed to a record \$48 billion in the first quarter of 2007, about twice the volume of all covenant-lite loans made in all of 2006. These loans were made to private equity firms to finance leveraged buyouts, where in many cases, private equity firms put up only 20 per cent of the purchase price, borrowing the rest from the banks. By late July, such covenant-lite loans, reflecting the overall climbing risk aversion, began to dry up.

<sup>3</sup>“Asian Central Banks Refrain From Extra Cash Injection”, Bloomberg, August 13

With cheap debt, which had driven much of the mergers and acquisitions boom, no longer available, deal-flow was expected to be adversely affected, with its consequent impact on the stock market and the economy.

### Impact on the US dollar – unwinding of the carry trade

For the past year, due to low volatility in the asset markets, particularly in the interest rates and foreign exchange markets, investors had been engaged in a type of investment play called the “carry trade”. Essentially, this entailed borrowing in a low-interest currency, like the Yen, and investing the proceeds in a higher-yielding asset, like the US Dollar or US Dollar assets<sup>4</sup>. If the exchange rate did not move, the investor would earn the interest rate differential – eg., a 5 per cent yield if US interest rates were at 5.25 per cent and Yen at 0.25 per cent.

The subprime crisis had led to speculation that the Fed would have to cut rates to prop up the economy, which would narrow the interest rate differential. This would have the effect of unwinding the carry trade, leading to a buyback of Yen and sale of US dollars, and causing a depreciation of the US dollar versus the Yen (Chart 8).

**Chart 8 – Depreciation of the USD**



### Government acts to shore up subprime

On 31 August, President George Bush announced plans to let the Federal Housing Administration (FHA) guarantee loans for delinquent subprime borrowers that would allow homeowners to refinance at reasonable rates and hence avoid foreclosure. The President aimed to raise the ceiling for insuring FHA loans to \$417,000 from \$362,790, lower down-payment requirements, and implement a risk-based insurance premium program to begin 1 January 2008. The President also said that he would support proposals in Congress that would provide tax relief for borrowers who refinanced.

Additionally, the FHA would be introducing a new program called “FHASecure” that would allow homeowners who had a good credit rating, but were unable to afford their current payments, to refinance

<sup>4</sup> Other currencies like the low-yielding Swiss franc had also been used as a “funding currency” and proceeds invested in higher-yield currencies like AUD or NZD.

into FHA insured mortgages. This program, effective immediately, was expected to help 240,000 families avoid foreclosure. To qualify for FHASecure, eligible homeowners had to meet the following five criteria:

- (1) A history of on-time mortgage payments before the borrower's teaser rates expired and loans reset;
- (2) Interest rates must have or will reset between June 2005 and December 2009;
- (3) Three per cent cash or equity in the home;
- (4) A sustained history of employment; and
- (5) Sufficient income to make the mortgage payment.

The program was expected to provide much-needed liquidity to the mortgage market. FHA also anticipated more lenders would offer FHA-insured loans, pool them, and securitize them with the Government National Mortgage Association (Ginnie Mae), backed by the full faith and credit of the U.S. government.

Whether such measures were enough to contain the subprime crisis and restore confidence remained to be seen.

### The capitalist system – some will lose, some will win

**Table 9: Loser and winners**

Fund	Manager	July%	YTD %
Global Alpha	Goldman Sachs	-9	-16
Paulson merger arbitrage	Paulson & Co	11.8	43
Paulson event arbitrage	Paulson & Co	23.7	60
Paulson Credit Opportunities	Paulson & Co	76	303
Paulson Credit Opportunities II	Paulson & Co	56	150
Hayman Subprime Credit Strategies	Hayman Capital Partners	107	305.1
Hayman flagship		60.3	149.1
Passport	Passport Management LL	35.8	100.7

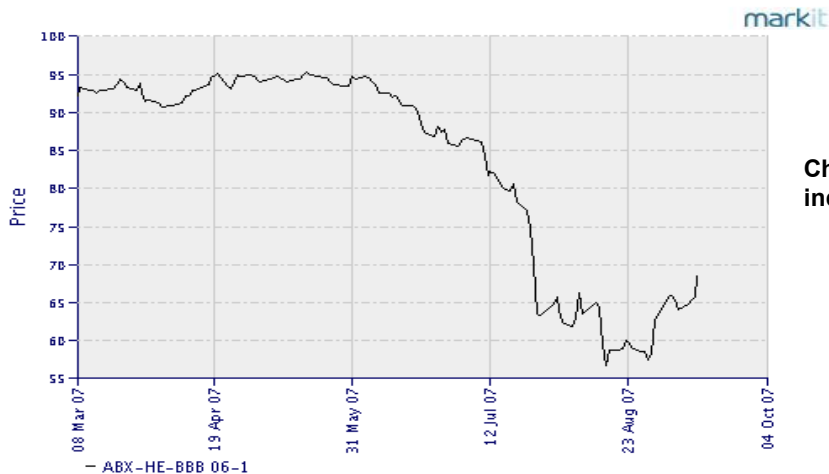
Source: Bloomberg

As in any market movement, there were losers and there were also winners. New-York based Paulson & Co, Dallas-based Hayman Capital Partners, and San Francisco-based Passport Management LLC, were amongst the bigger winners in the subprime market rout, astutely calling for a market top in the housing market and making short bets against the subprime sector.

The Paulson Credit Opportunities Fund gained 303 per cent this year as of July 31, while Hayman's Subprime Credit Strategies Fund hit a home run with a 305 per cent gain for the year to July, climbing 107 per cent in July alone. The flagship Hayman Capital Master Fund rose 60 per cent in July and 149 per cent for the year. It bet on falling subprime mortgage-backed securities and corporate credit. The fund also bought non-U.S. stocks and debt, while betting that U.S. consumer-based equity, preferred shares and debt would tumble, according to their newsletter.

One of the winning ways of these hedge funds was by betting on a decline in the ABX subprime index (Chart 10). Created by London-based Markit Group, the ABX Index is a series of credit-default swaps<sup>5</sup> based on 20 bonds that consist of subprime mortgages. A decline in the ABX Index signifies investor sentiment that subprime mortgage holders will suffer increased financial losses from those investments. Likewise, an increase in the ABX Index signifies investor sentiment that subprime mortgage holdings will perform better as investments.

<sup>5</sup> A credit default swap (CDS) is an agreement between a protection buyer to pay a periodic fee to a protection seller in exchange for a contingent payment by the seller upon a credit event happening in the reference entity. On trigger of the event, the protection seller either takes delivery of the defaulted bond for the par value or pays the protection buyer the difference between the par value and recovery value of the bond



**Chart 10: ABX\_HE-BBB 06-1 index**

Hedge funds like the \$7 billion Paulson & Co led by former Bear Stearns investment banker John Paulson, shorted the index. The ABX short bet came up a big winner when the index plunged as the subprime market collapsed.

Even small trading funds had been able to cash in on the market plunge. Parrot Trading Partners, a \$10 million fund managed by father-and-son team Jes and Charlie Santaularia, made 15 per cent for the year, using options. Anticipating a slowdown driven by a credit crunch, Parrot profited from falling asset prices and increased volatility via the option market. Besides shorting credit, astute funds employed other strategies, such as betting on energy and other assets like currencies and interest rates, enabling one such fund, BAM Asset Management, to gain 62 per cent for the year. Others focused on equities, avoiding the credit market altogether.<sup>6</sup>

### **Failure of risk management?**

The rout in the subprime market and the subsequent fallout in other asset markets highlight the increasing risks facing market participants and even non-participants, as inter-asset interaction, financial innovation and the attendant complexity, and rising leverage make things change faster, effects spread wider, and consequences much less predictable. All this, despite millions spent on implementing risk management systems in preparation of Basel II. What happened?

#### *Failure of due diligence*

The lax lending rules and poor credit risk control among lenders highlight the risk of inadequate risk control at its very basic level, as ample liquidity lured investors into making poor lending decisions by chasing after volume instead of quality. From mortgage lenders to banks and other wholesale lenders, from investment firms to hedge funds and pension funds, insufficient attention was paid to the quality of the loans. The complex structure of the whole supply chain obscured the dangers, as one layer trusted the layer below to have done a proper job.

#### *Breakdown of correlation assumptions and risk parameters*

Despite the sophisticated systems used by banks to help weigh risks in trading asset-backed securities, such systems may have erred in their assumptions about the correlation between different securities and different types of securities. Securities may behave differently from one another in favorable market conditions, but, as seen in the Asian crisis, correlation tended to go up in a market crisis, and the risk management models might not have factored that in. They might also have been calibrated for stable market conditions and cheap money - conditions of the past few years - and unprepared for ten standard deviation events.

<sup>6</sup> Source: "Cleaning up on the Meltdown", BusinessWeek, 27 August 2007

### *Liquidity risk can't be hedged*

Risk management models could in fact encourage a herd mentality. While rising delinquencies in the subprime market played a role in the sell-off, the market crisis was exacerbated by the liquidity issue. Given the same set of data, with risk management models running along similar principles (eg., the widely used RiskMetrics by JP Morgan), investors could end up with similar portfolios, with the same exit signals when volatility rose. Consequently, when people sell into a downward market, a gap between what would be fair value according to the model, and what the market was willing to pay, would emerge. One-day Value at Risk valuations (VAR), which investors and investment banks used to measure how far the value of a portfolio may fall in a single day, have been made worthless as markets for some assets dried up for lack of buyers.

As Bill Gross pointed out, "Our current system of levered finance and its related structures may be critically flawed... Nothing within it allows for the hedging of liquidity risk, and that is the problem at the moment."

### *'Model risk' is the biggest danger of all*

The subprime crisis highlighted the chasm between marked-to-model and marked-to-market, as sophisticated market players like the Bear Stearns hedge funds have found out to their distress. While complex financial models for mortgage-backed securities looked at the likelihood that the holders of the underlying mortgages would default or prepay in order to estimate the cash flows the mortgages would produce to fund the various tranches of CDOs, CDOs remained a relatively new product, and some of the mortgage products used in CDOs were also relatively new. Credit risk models had only six or seven years of default data on CDOs in a period of very benign default rates. Hence the cost of risk could have been severely underestimated.

### *Blame it on Basel (I)*

Under Basel I, a housing loan with a loan-to-valuation ratio (LVR) of 20 per cent where the borrower has ample income to repay the mortgage, is given the same risk weighting as one where the LVR is 90 per cent and the borrower has barely enough income to cover the repayments. Given the risks in the latter case, the bank has to price it higher than the first. The incentive for banks chasing high returns, therefore, is to load up on poor quality but high-paying, debt, since the capital costs before considering credit losses are the same. In the case of the subprime crisis, if banks had considered credit losses unlikely, then they would certainly load up on the poor quality loans and even drop the price to sell more. Under Basel II, with finer dissection of risk buckets, it is hoped that appropriate risk capital charges would be applied, to prevent such actions.

Hence, the subprime crisis could be considered a failure of risk management, for all the technological improvements and financial sophistication of modern risk management systems. That said, even the most effective risk management models would not be worth anything if executives ignored the information, particularly during good times when the champagne is flowing. Accurate inputs, correct parameter specifications, proper systems and, most importantly, the right mindset, are needed if risk management is to be useful in mitigating uncertainty and reducing losses. And even then, there's usually something new to catch us by surprise.

*Written as at August 2007.*

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