

# OVER THE COUNTER DERIVATIVES & STRUCTURAL INVESTMENT VEHICLES A SPECIAL LOOK AT THE LATEST FINANCIAL INNOVATION AND THEIR ROLE DURING THE US FINANCIAL CRISIS 2007-2009

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## ***Abstract***

This Paper seeks to explain the role of financial innovations behind the financial crisis 2007-2009 with a special focus on over the counter derivatives and structural investment vehicles, their role in US financial system and how these factors generated and worsen the crisis. Financial crisis 2007-2009 which starts from the United States sub-prime mortgage market and spread to US financial sector and later on spread to the rest of world. This is said to be the even bigger crisis than the Great Depression of 1929. This crisis is unique in this way that in history we haven't seen such a bigger impact world wide from any crisis. This paper would analyze the main causes which are right in the heart of the crisis and least discussed.

**Keywords:** (1) Structural Investment Vehicles (2) Over the Counter Derivatives (3) Financial Innovations (4) Derivative Market (5) Mortgage Back Securities (MBS)

## ***Resumen***

Este artículo tiene como objetivo explicar las innovaciones financieras detrás de la crisis financiera 2007-2009, con énfasis en el mercado extra-bursátil y los vehículos de inversión estructural, su papel en el sistema financiero de los Estados Unidos y cómo estos factores generaron y empeoraron la crisis. La Crisis Financiera 2007-2009 que se inicia desde el mercado de las hipotecas de alto riesgo de los Estados Unidos y se extendió al sector financiero de EE.UU. y más tarde al resto del mundo, se dice que es una crisis aún mayor que la Gran Depresión de 1929. Esta crisis es única ya que nunca antes en la historia se ha visto una crisis de impacto mundial como esta. Este trabajo analiza las causas principales de la crisis que han sido poco debatidas.

**JEL Classifications:** F37, F34, F33

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## Introduction

Innovation is said to be blessing for the mankind but sometimes this blessing convert into curse when there is a misuse of the innovation. Financial innovations played an important role in this crisis. Introduction of so much financial innovations without ample time to judge their reliability was one of the reasons of this crisis. Although innovations always appreciated round the corner but these innovations require lot of time to implement them so that complexity of issues should be resolved.

This also happened in Financial Crisis of 2007-2009 when these innovations played a negative part. The term 'financial crisis' is used too loosely, often to denote either a banking crisis, or a debt crisis, or a foreign exchange market crisis. It is perhaps preferable to invoke it only for the 'big one': a generalized, international financial crisis. This is a nexus of foreign exchange market disturbances, debt defaults (sovereign or private), and banking system failures: a triple crisis, in which the interactions are the key to causality, depth, and persistence (Eichengreen and Portes, 1987). Financial Crises could involve either bank or currency crises or indeed, both of them could take place at the same time (Daianu & Lungu, 2008). Delargy and Goodhart (1999) argue that both the late 19<sup>th</sup> century crises and those in the late 20<sup>th</sup> were more likely when loose credit conditions in the lending countries were in place. Subsequently, when credit conditions suddenly adversely changed it generated a boom and bust economic cycle.

Financial Innovations especially which were introduced in 90's played a significant role in the Financial Crisis of 2007-2009. Innovations were introduced without proper verifying there results or giving them ample time to check their viability. Some of them were so complex that it creates mess in the market. Greed of profit and will to expand the market overcome the general procedures.

Apart from the introduction the paper has been divided into three main parts. First we would discuss Over the Counter Derivatives (OTC) their structure, functions and how they participated in the Financial Crises. Secondly the Structural Investment Vehicles (SIV), their structure, market and how it generated and worsens the crisis. Finally we would draw some conclusions.

### Over the counter (OTC) derivatives

Over The Counter derivatives<sup>1</sup> had been legally permitted in United States for the first time in 1993 after these were invented by JP Morgan in late 1990 (Jones & Bourse, 2009). This

<sup>1</sup> Derivatives are used to handle the loss risk arising from changes in the value of the underlying. This is known as hedging. Alternatively, derivatives can also be used by investors to take a risk and make a profit if the value of the underlying moves the way they expect. This activity is known as speculation. Broadly speaking we divide the derivative contracts into two types: Over the counter (OTC) and Exchange traded derivatives (ETD). OTC derivatives are contracts that are traded directly between two parties, without going through an exchange or other intermediary. It includes Swaps, Forward rate agreements, and exotic options. ETD derivatives are those derivatives that are traded via specialized derivatives exchanges or other exchanges.

permission allowed the growth of a business that is now estimated at over a hundred trillion dollars annually in terms of the notional value of contracts worldwide. Growth of this market was the most significant development in financial markets of 1990s (Greenspan, 2009).

According to Kregel, (1998) banks also offer derivative contracts to their clients in the “over-the-counter” market. These are not derivatives on organized markets, but rather individually tailored, often highly complex, combinations of standard financial instruments, packaged together with derivative contracts designed to meet particular needs of clients. They are often executed through special purpose vehicles. They generate substantial fee and commission income although bank committing none of its own capital but serving as an intermediary matching borrowers and lenders.

### Global OTC market

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The global OTC Derivatives market<sup>2</sup> is very large, considerably larger than the listed equity market and the exchange-traded derivatives market. Information on OTC derivatives volume is generally traced from the data collected by the Bank for International Settlements (“BIS”). Table 1 below from BIS shows the derivatives position.

**Table 1**  
**Global OTC Derivatives Market Amount Outstanding**

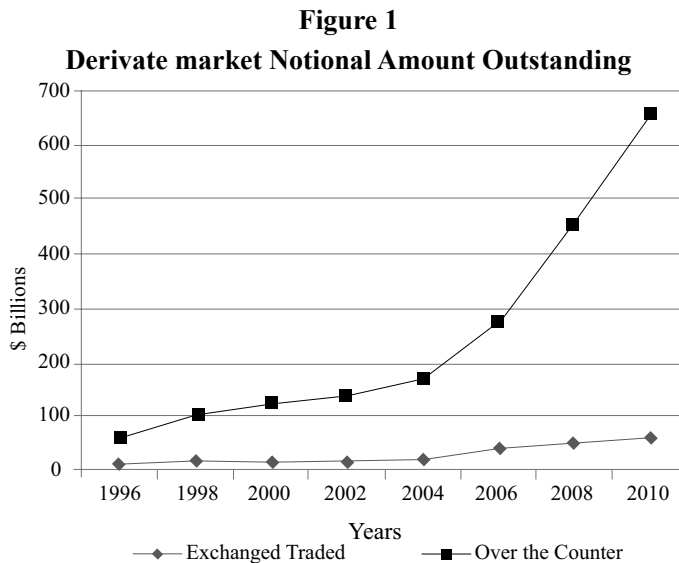
	<i>National Amount outstanding (\$ Billions)</i>	<i>Gross Market Value (\$ Billions)</i>
June 2007	516,407	11,140
December 2007	595,341	15,813
June 2008	683,726	20,353
December 2008	591,963	33,889
June 2009	594,553	25,298
December 2009	603,900	21,542
June 2010	582,655	24,673
December 2010	601,048	21,148

Self-made Table (Data Source: Bank of International Settlements) [www.bis.org](http://www.bis.org)

For all OTC derivatives in December 2008, BIS reported a notional amount outstanding of \$592 trillion and a gross market value outstanding of \$34 trillion. Interest rate contracts and foreign exchange contracts are the two largest sources of OTC derivatives volume. For those types of products that appear to be securities-related credit derivatives and equity derivatives in December 2008, BIS reported a notional amount outstanding of \$48.4 trillion and a gross market

<sup>2</sup> There are different instruments in this market. Mostly traded instruments are foreign exchange and interest rate derivatives. The instruments which were most implicated in the financial crisis were Collateralized Debt Obligations (CDOs) and structured products (SIVs). In addition much attention has been focused on Credit Default Swaps (CDS) which would seem to have been less heavily implicated. Of these, CDS are actually traded in considerably greater volume on the OTC derivatives market than CDOs.

value outstanding of \$6.8 trillion. A notional amount of \$70 trillion and a gross market value of \$5 trillion are “unallocated” for December 2008. Clearly, this volume of largely unregulated financial activity is enormous, even when just considering the relatively small volume component that is securities-related. Volume of OTC derivatives is far beyond the ETD. Figure-1 below:

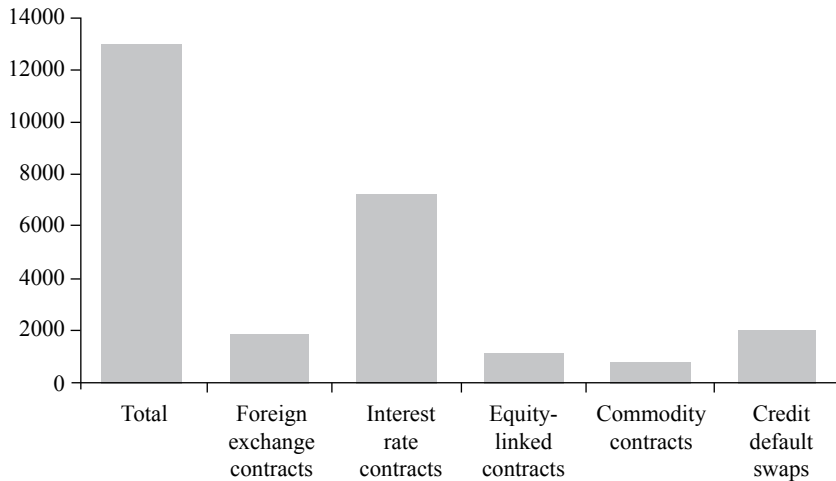


self made figure (Data Source: Bank of International Settlements)

According to Segoviano and Singh (2008) the over-the-counter (OTC) derivatives market has grown sizably in the past years. Notional amounts of all categories of the OTC contracts increased rapidly. These include foreign exchange contracts, interest rate contracts, equity linked contracts, commodity contracts, and credit default swaps (CDS) contracts. Interest rate contracts continue to be the largest segment of this market comprising 66 percent of all OTC derivative market or about \$400 trillion. Growth in the credit derivatives segment has been the fastest and the volume has more than doubled in the last year to about \$60 trillion.

The derivative markets have been accused for their alleged role in the financial crisis. The leveraged operations are said to have generate an “irrational appeal” for risk taking, and the lack of clearing obligations also appeared as very damaging for the balance of the market (Kelleher, 2008). The collapse of Bear Stearns, sale of Merrill Lynch & Co and the bankruptcy of AIG suggest a clear role of OTC derivatives in the crisis (Kevin & Christopher, 2009). Credit Default Swaps (CDS) played an important role in the fall of these giants. “This is the derivative nightmare that everyone has been warning about. They booked all these derivatives assuming bad things would never happen. It was like writing fire insurance, assuming no one is ever going to have a fire, only now they’re turning around and watching as the whole town burns down.” (Peter Schiff, President of Euro Pacific Capital)

**Figure 2**  
**Global OTC Derivatives Market, Dec. 2007 (\$ Billions)**



Self made figure (Data Source: Bank of International Settlements) [www.bis.org](http://www.bis.org)

According to Dodd, 2008, collateralized (CDO) and Credit derivatives, unlike publicly traded securities and future contracts, are not traded on exchanges but on over-the-counter (OTC) markets. During the financial crisis markets for subprime mortgage-backed securities became illiquid, at that time highly leveraged investors such as hedge funds needed to adjust positions or trade out of losing positions. This left hedge funds locked into damaging positions at the same time they faced margin calls for collateral from their prime brokers.

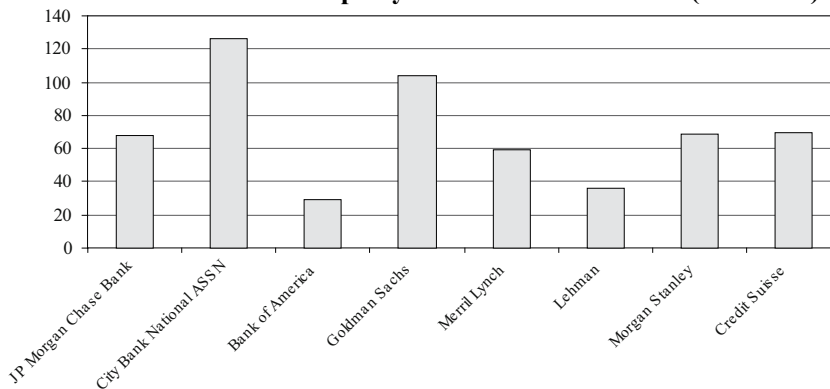
The fundamental derivative which was at the heart of this crisis was the CDO on asset backed securities. CDOs were the way in which banks securitized mortgages (Jones & Bourse, 2009). However, rather than being heavily traded on the OTC derivative market, many of the CDO instruments were sold to banks' off-balance sheet entities such as structured investment vehicles (SIVs), which many commentators have regarded as the beginning of the real crisis of confidence in the banks (Tett, 2009).

The situation becomes more exacerbated because, without trading, there were no market prices to serve as benchmarks and no way to determine the value of the various risk tranches (Dodd, 2008). Trading is between customers and dealers in OTC market, and prices and volumes of trades are not disclosed. The price discovery process is not transparent, and there is no surveillance of the market to identify where there are large or vulnerable positions. Moreover, unlike exchanges, these OTC markets have no designated or otherwise institutionalized market makers or dealers to ensure liquidity (Dodd, 2008). Because OTC market was not transparent, investors became panic. This situation creates an environment of run on the shadow banking sector which make the situation more vulnerable.

### Counter party liabilities

OTC markets also suffered from a failure of liquidity. Instead of showing resilience in the face of greater price volatility, these markets ceased trading as counterparties became untrustworthy and buyers fled. Figure 3 below shows the counterparty liabilities on March 2008.

**Figure 3**  
**OTC Derivatives Counter party Liabilities March 2008 (\$ Billions)**



Self-Made Figure (Data Source FDIC)

AIG (notionally an insurance company) generated \$500 billion worth of exposure on paper rated AAA by the ratings agencies. Positions which, when written, were intended to make three or four basis points ended costing something like 800 basis points. The underlying portfolios of assets were sub-prime in many cases, and the ratings agencies accepted in their entirety mathematical models which calculated the chances of loss in these instruments as being extremely small.

### OTC and financial crisis

Many investors were able to leverage positions in these tranches by obtaining funding in markets such as the Canadian 30 day CP market and when this and other markets failed they had to liquidate with catastrophic effects (Jones & Consult, 2009).

To compound the problem, the banks exacerbated the rating abuse situation with insufficient controls to recognize that they were being deceived by their own marketing hype by optimistically valuing risk. The losses involved here are at the root of all bank revaluation of toxic asset issues.

In a study undertaken by JP Morgan Chase<sup>3</sup> reached the conclusion that in the top five recent bankruptcies, payments from sellers of CDS protection were considerably smaller than

<sup>3</sup> Study can be traced on JP Morgan Chase and Company's presentation to the investors on this website: <http://files.shareholder.com/downloads/ONE/692003482x0x275126/19682387-d023-4e95-bf23-287d789ff656/Derivatives-BillWinters.pdf>

bondholder losses. In the case of Lehman for example, senior bondholder loss was \$101 billion, while payments from sellers of CDS protection only amounted to \$5 billion on a gross notional figure of \$72 billion. In the case of AIG the figures were equally compelling. On AIG's corporate referenced CDS with a notional value of £180 billion (representing 48% of total notional value) the actual losses were barely £2 billion (representing only 6% of the total loss). This compared with their multi sector CDO on ABS with a notional value of \$196 billion (representing 52% of total notional value) resulting in actual losses of \$31 billion (representing 94% of the total loss). In other words while CDOs represented just half of the notional value they represented virtually all of the total loss. Having said this it is worth mentioning that one of the reasons the AIG losses on CDS were not that great was because AIG was effectively bailed out.

According to McKenzie, 2009, the financial crisis has illustrated that these risks are not theoretical but real. Bear Sterns, Lehman Brothers and AIG were important players in the OTC derivatives market, either as dealers or users of OTC derivatives, or both. The trouble they experienced originated outside the OTC derivatives markets, it entered the derivatives market via the CDS written by these three institutions and, because of these institutions' central role in all OTC derivatives markets and it spread beyond CDSs and affected the world economy. The opaqueness of the market prevented, on the one hand, other market participants from knowing exactly what the exposures of their counterparties were to these three entities, which resulted in mistrust and in the sudden drying up of liquidity.

The current financial crisis is requiring policy makers to rethink the existing approach to market regulation and oversight. Many observers have singled out over-the-counter (OTC) derivatives, including credit default swaps, as needing greater scrutiny and transparency (Lukken, 2008). If we are to avoid repeating the mistakes of the past, we must strive to increase the transparency of these transactions and find ways to mitigate the systemic risk created by firms that offer and hold these off-exchange instruments.

While wholesale regulatory reform will require careful consideration, there is one immediate and proven solution at hand: centralized clearing. Clearinghouses have been around almost as long as trading itself as a means for mitigating the risks associated with exchange-traded financial products (Lukken, 2008). Whether securities, options, or futures, centralized clearinghouses ensure that every buyer has a guaranteed seller and every seller has a guaranteed buyer, thus minimizing the risk that one counterparty's default will cause a systemic ripple through the markets. The clearinghouse is able to take on this role because it is backed by the collective funds of its clearing members.

### Structural investment vehicles (SIV) and off balance sheet entities

Special purpose Vehicle (SPV)<sup>4</sup> also called Special Purpose Entity (SPE) is a legal entity (Usually a limited company or limited partnership) created to fulfil narrow, specific or temporary objectives. SPE are typically used by companies to isolate the firm from financial risk. A company will transfer assets to SPE for management or use the SPE to finance a large project thereby achieving a narrow set of goals without putting the entire firm at risk. SPEs are mostly set up as “Orphan Companies” with their shares settled on charitable trust and with professional directors provided by an administration company to ensure that there is no connection with the sponsor.

According to Bosworth & Flaaen (2009) the rapid growth of these securities within off-balance sheet entities called Structured Investment Vehicles (SIVs) also led to large increases in the size of the issuing institutions without a matching increase in capital. The lower capital requirements associated with such SIVs allowed these financial institutions (often investment banking firms) to dramatically increase their effective leverage ratios.

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#### SIV size

Fry (2007) pointed that 36 SIVs worldwide deploy about \$400 billion in capital. These 36 SIVs have leveraged their capital to about \$2 trillion worth of actual exposure. SIVs could obtain cheaper funding than banks could, and thus increased the spread between their short-term liabilities and long-term assets — and for awhile they earned high profits. SIV assets reached \$400 billion in July 2007 but it could be more since they are off the books (Moody’s 2008). But according to CNN there were about 30 SIVs having estimated \$320 Billion in October 2007. Table-2 below shows the top five SIVs their managers, Assets held and Status

**Table 2**  
**Top Five SIVs on October 2007**

<i>Name</i>	<i>Manager</i>	<i>Assets(\$ Billions)</i>	<i>Status</i>
Sigma Finance	Gordian Knot	\$57.6	In Operation
Beta Financ	Citigroup	\$19.3	In Operation
Five Finance	Citigroup	\$12.9	In Operation
Sedna Financ	Citigroup	\$13.2	In Operation
Axon Financial	Axon Financial Service	\$9.9	Unable to secure funding

Self-Made Table (Data Source [www.money.cnn.com](http://www.money.cnn.com))

<sup>4</sup> A structured investment vehicle (SIV) was invented by Citigroup in 1988. These SIVs were very popular until the market crash of 2008. The strategy of these funds was to borrow money by issuing short-term securities at low interest and then lend that money by buying long-term securities at higher interest, making a profit for investors from the difference. It also allowed the banks to keep billions in assets off balance sheet, and freed them from regulatory capital requirements on those assets.

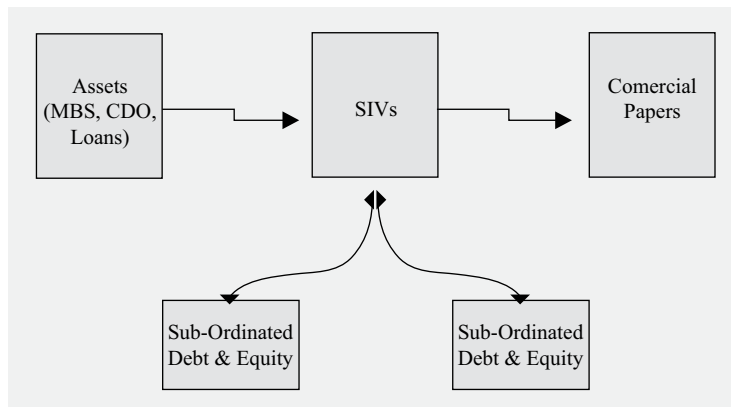


**SIV Structure**

SIVs had an open-ended (or evergreen) structure; they planned to stay in business indefinitely by buying new assets as the old ones matured, with the SIV manager allowed to exchange investments without providing investors transparency or the ability to look through the structure.

Figure-4 below illustrates the basic cash flows. The SIV bought long-term debt assets, often mortgage-backed bonds, from which it received interest income. Purchase of these assets was financed by issuing short-term debt, usually commercial paper. The SIV's net revenue was determined by the difference, or spread, between these two cash flows; the operation was profitable so long as the payouts from the assets exceeded interest payments to the commercial paper holders.

**Figure 4**  
**SIVs Cash Flow**



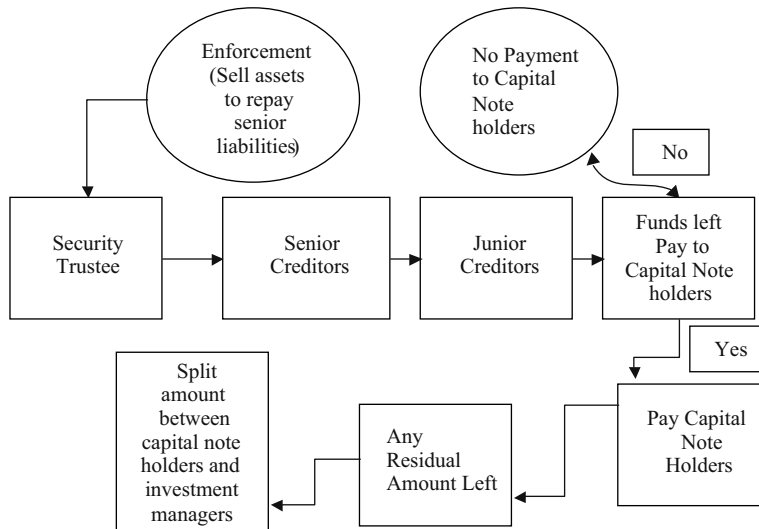
Self-Made Figure

The SIV parent will issue subordinated debt to capital note investors. Both the SIV parent and its SIV subsidiary issue into the capital markets a mix of MTNs and CP rated ‘AAA’ and ‘A-1+’, respectively. The SIV parent uses the net proceeds of such issuance to purchase highly rated securities held for the benefit of the security trustee by the custodian. The SIV parent receives interest and principal from its assets and uses these proceeds to pay interest and principal on its liabilities.

SIV has different participants.<sup>5</sup> Every participant plays its role in the SIV operations. Payment structure is defined. Figure-5 below shows the payment structure of the typical SIV.

<sup>5</sup> The various participants in a SIV transaction are: The shareholders of the SIV. A charitable trust normally owns the SIV's shares; The senior and subordinated investors to whom the liabilities of both the SIV parent entity and the SIV subsidiary are owned under the CP programs, the MTN programs, and the capital note program; The investment manager/investment adviser responsible for acquiring eligible investments; managing market, credit, and liquidity risk associated with the portfolio. The security trustee, who will in an

**Figure 5**  
**SIVs Payment Waterfall**



Self-made figure

The SIV parent enters into hedge agreements to manage interest rate and foreign exchange exposures arising from its mix of assets compared with liabilities. It also enters into liquidity agreements with highly rated banks to provide liquidity loans to assist it in repaying short-term liabilities as they fall due.

First of all senior liabilities are being paid and then security trustee has been paid. After that senior creditor such as MTN, CP holders, hedge counterparties, liquidity banks are paid. Junior creditors such as paying agents, Custodians, dealers, etc. are being paid after the senior creditor has been paid. Capital note holders would not receive any amount if nothing left. If perhaps anything left capital note holders would be rewarded. Anything left would be distributed among the capital note holders and investment managers.

SIV has different operation modes. In normal operations mode, the investment manager (or any person who is appointed by the investment manager to perform certain duties) provides the SIV with management services with respect to investment and funding. These services are consistent with the covenants given and the agreements entered into by the SIV and its various market participants

enforcement event realize its charge over the collateral with the main objective of arranging for the timely payment in full of the SIV's obligations to the priority creditors; The issuing and paying agents who will issue the notes and make payments to the note holders under the CP, the MTN, and capital note program documents; The calculation agent, who calculates the interest rates applicable to any variable MTNs or capital notes issued; dealers and placement agents, who will place the notes issued with investors on the SIV's behalf; the liquidity banks, who are required to make loans to the SIV under the liquidity agreements; The hedge counterparties with whom the SIV will enter into hedge agreements for the purpose of hedging any market risk related to the portfolio; and the external auditors, who will conduct a full audit on a regular basis, the results of which are also provided to Standard & Poor's.

In defeasance mode the vehicle is, therefore, in wind-down. The primary difference between the defeasance and enforcement modes is that in defeasance the investment manager manages the wind-down and in enforcement the security trustee manages the process. Also, in defeasance, because the security trustee has not yet enforced its security, there is potential for the vehicle to return to limited or normal operations.

Once a SIV enters into enforcement mode, it has reached the point of no return. While in normal, limited, and, if appropriate, defensive modes the investment manager manages the SIV, in enforcement the portfolio is managed by or on behalf of the security trustee until it is fully wound down.

### **CITI's siv profile**

Setser (2007) by refereeing (Yves Smith) of naked Capitalism pointed out that the centre of SIV is Citi Bank. But according to Wall Street Journal, Citi –an American bank– was the centre of the SIV-world, even if most of Citi's SIVs were managed out of London and registered in the Caymans. Citibank had over \$100 billion in SIVs, though that has dropped to \$80 billion in the past few months.

City group is said to have the biggest holder of SIVs in the world. SIV Asset mix includes CMBS, MBS, CBO, CLO and CDO, while average credit quality is AAA highest (54%), AA (43%) and A only (3%).

Commercial papers are used as a source of short-term borrowing by many SIVs. The maturity is generally between three months and one year. The profits were distributed in two ways: first as fees for services to the sponsoring institution, and second, as dividends or interest to holders of subordinated debt and equity, who were the nominal owners of the SIV.

Many of the assets held by SIVs were mortgage-related, but rarely were they actual loans. Rather, they were securities backed by pools of loans, in which the interest and principal payments of homeowners are passed through to the holders of the bonds. Financial engineers also bundled mortgage-backed bonds into pools of securities called collateralized debt obligations (CDOs), and sold claims against them. CDOs were carved into various classes with different risk characteristics and yields. The portions of the pool that proved most difficult to sell might be pooled again, carved up, and resold - in a so-called CDO squared.

### **COMMERCIAL PAPERS AND SIVs**

According to Baily, (2008) SIVs needed to raise money of their own. They usually did this by issuing commercial paper i.e. promissory notes promising to pay back from two to 270 days. Every two to 270 days, therefore, SIVs needed to pay back their debt – and they did this simply by issuing more debt on the same basis. Until the credit crunch hit in August 2007, this business model worked smoothly: a SIV could typically rollover its short term liabilities automatically. Liquidity risk was not perceived as a problem, as SIVs could consistently obtain cheap and reliable funding, even as they turned to shorter term borrowing.

Mauldin (2007) pointed out that due to the credit rating agencies SIVs sell commercial papers very easily over the Government bonds because they got easily the AAA rating. In fact, it was very easy to leverage SIV 10-15 times or more. Then that money was used to buy longer-term paper which pays higher rates. Difference between the cost of commercial papers and the interest received is called the spread.

Getting a spread of 4% and leverage it up 10-15 times was not bad thing, especially when the investment was in safe investment-grade paper. And in the beginning, the spreads were high so the banks decided to get in on the deal. Figure below shows the clear interest of the investors in the Asset-Backed Commercial Papers over Non-ABCP.

### How SIVs caused crisis?

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Until late 2007, refinancing short-term loans had not been a problem for SIVs. However, in August 2007, due largely to the fear that SIVs may be holding large amounts of subprime mortgages, banks and the commercial paper market stopped lending to SIVs at favourable rates. Investors thought that the sub-prime-related assets like Asset Back Securities had no worth. Hence the investors were unwilling to buy the debt issued every two to 270 days (or so) by SIVs in order to fund themselves. And with no one willing to buy their debt, the SIVs ran into big trouble.

Since SIVs could not borrow new money, but had to pay old back loans that were now due, they were forced to sell some of their long-term investments to raise cash. Since this inability to raise money hit all SIVs at the same time, a large number of long-term investments became available for sale at the end of 2007. The large number of the types of investments that SIVs held becoming available pushed their value down. This caused many SIVs to lose huge amounts of money as they sold assets at a loss in order to pay their debts.

This problem with SIVs created a big headache for the banks which had set them up. Although many SIVs were off-balance sheet, it wouldn't have made the banks look good if they'd been willing to let the people who'd invested in SIVs lose all their money. As a result, some banks chose to bring SIVs back onto their balance sheets, incurring huge write downs and losses in the process.

In 2007, for example, Citigroup brought SIVs worth \$49bn back onto its books. Its investors had been unaware of their existence only months before. Sub-prime write downs and related losses pushed America's largest bank to post its biggest profit decline in three years and the stock is down more than 31 per cent since the beginning of the year (Kennedy, 2007). Citi own seven SIVs with \$80 Billion. Since July Citi sold more than \$ 20 Billion of SIV assets.

In 2007 the \$6.6 billion Cheyne Finance Plc became the first SIV to default on its CP (Eric Fry 2007). According to the Financial Times, "More than \$42 billion of assets in SIVs...are facing limits on their operations." But that still means about \$300 billion of SIV assets are struggling for survival. And they will likely continue to struggle, not merely because they cannot access funding, but also because their assets are deteriorating

The Asset Back Commercial Paper (ABCP) market nearly ceased functioning in 2007. In August 2007, ABCP outstanding totalled nearly \$1.2 trillion – representing about half of the entire Commercial Paper (CP) market. Since then, however, ABCP outstanding has tumbled by \$279 billion, while the other half of the CP market has remained exactly the same (Fry, 2007). In other words, traditional corporate borrowers like IBM may still tap the CP market, but not asset-backed entities.

On 07<sup>th</sup> July 2009 Telegraph reported that analysts at Fitch Ratings estimate that 95pc of assets held in SIVs since their peak in July 2007 have been disposed off as the vehicles have been wound down. Of the 29 SIVs, five have been restructured, 13 were consolidated on to the sponsoring bank's balance sheet and seven defaulted on payments on their senior notes. Fitch estimates that the remained four have been able to unwind themselves. If the SIVs were unable to consolidate or restructure the senior note, on average investors lost 50pc of their investment, according to Fitch.

According to Fry (2007) the Federal Reserve appears to have absorbed about \$25 billion in MBS securities via “temporary” repurchase agreements. According to Telegraph (7<sup>th</sup> July 2009) Many SIV investors have gone to court to demand a more equal share of the value left in SIVs. However, the newspaper said chances of receiving much money look slim as Ernst & Young, the receiver of Sigma Finance which went bust last October, only managed to raise \$306m for assets with a face value of \$2bn. Some investors are chasing hundreds of millions of pounds. Almost all of the \$400 Billion of assets held in structured investment vehicles (SIVs) has been disposed of in just two years.

Calpers, the biggest U.S. public pension fund, has sued the three largest credit rating agencies for giving perfect grades to securities that later suffered huge subprime mortgage losses (Reuters, 15<sup>th</sup> July 2009). The California Public Employees' Retirement System said in a lawsuit filed in California superior Court in San Francisco that it might lose more than \$1 billion from Structured investment vehicles, or SIVs, that received top grades from Moody's Investors Service Inc, Standard & Poor's and Fitch Inc. According to the fund by giving these securities their highest ratings, the agencies “made negligent misrepresentations” to the pension fund. Such ratings, which typically accompany investments with almost no risk of loss, proved to be wildly inaccurate and unreasonably high.

SIVs were in problem due to three factors. First, they involved the use of innovative securities, which were hard to value in the best of circumstances and which had little history to indicate how they might behave in a severe market downturn. Second, risks were underestimated: SIVs were a form of highly-leveraged speculation, which was dependent on the assumption that the markets would always supply liquidity. Finally, they were off balance sheet entities: few in the markets had an accurate idea of the scope or nature of their activities until the trouble came. The result of the interaction of these factors with a credit market downturn in the SIVs and elsewhere is the most sustained period of instability in U.S. financial markets in many years.

Citi, J.P. Morgan Chase & Co. and Bank of America Corp. announced a plan on 15<sup>th</sup> October, 2007 to establish a superfund, called “Master Liquidity Enhancement conduit” or super

SIV to bolster the commercial paper market. The objective of the fund was to buy highly-rated assets from so called Structural Investment Vehicles (SIV) and to facilitate the refinancing of asset-backed commercial paper and complement other market-based solutions in supporting an orderly and efficient market environment (CNN, 15<sup>th</sup> October 2007).

But some critics, including former Federal Reserve Chairman Alan Greenspan, worry that the fund could prevent the establishment of a true market price for the securities. At the same time, others are concerned that the fund won't get up and running quickly enough to calm the markets

## Conclusions

42 ■ Some large investment banks, bank holding companies, and insurance companies, including Merrill Lynch, Citigroup, and AIG, experienced massive losses related to the subprime mortgage market because of significant failures of corporate governance, including risk management. Executive and employee compensation systems at these institutions disproportionately rewarded short-term risk taking. The regulators—the Securities and Exchange Commission for the large investment banks and the banking supervisors for the bank holding companies and AIG—failed to adequately supervise their safety and soundness, allowing them to take inordinate risk in activities such as nonprime mortgage securitization and over-the-counter (OTC) derivatives dealing and to hold inadequate capital and liquidity.

Financial Innovations also become curse instead of blessings. These new innovations like SIVs also played a role in the financial crisis. Until late 2007, refinancing short-term loans had not been a problem for SIVs. However, in August 2007, due largely to the fear that SIVs may be holding large amounts of subprime mortgages, banks and the commercial paper market stopped lending to SIVs at favourable rates. Investors thought that the sub-prime-related assets like Asset Back Securities had no worth. Hence the investors were unwilling to buy the debt issued every two to 270 days (or so) by SIVs in order to fund themselves. And with no one willing to buy their debt, the SIVs ran into big trouble. Since SIVs could not borrow new money, but had to pay old back loans that were now due, they were forced to sell some of their long-term investments to raise cash. Since this inability to raise money hit all SIVs at the same time, a large number of long-term investments became available for sale at the end of 2007. The large number of the types of investments that SIVs held becoming available pushed their value down. This caused many SIVs to lose huge amounts of money as they sold assets at a loss in order to pay their debts.

Over-the-counter derivatives contributed significantly to this crisis. The enactment of legislation in 2000 to ban the regulation by both the federal and state governments of over-the-counter (OTC) derivatives was a key turning point in the march toward the financial crisis. OTC derivatives contributed to the crisis in three significant ways. First, one type of derivative –credit default swaps (CDS)– fueled the mortgage securitization pipeline. CDS were sold to investors to protect against the default or decline in value of mortgage-related securities backed by risky loans. Companies sold protection –to the tune of \$79 billion, in AIG's case– to investors in these newfangled mortgage securities, helping to launch and expand

the market and, in turn, to further fuel the housing bubble. Second, CDS were essential to the creation of synthetic CDOs. These synthetic CDOs were merely bets on the performance of real mortgage-related securities. They amplified the losses from the collapse of the housing bubble by allowing multiple bets on the same securities and helped spread them throughout the financial system. Goldman Sachs alone packaged and sold \$73 billion in synthetic CDOs from July 1, 2004, to May 31, 2007. Synthetic CDOs created by Goldman referenced more than 3,400 mortgage securities, and 610 of them were referenced at least twice. This is apart from how many times these securities may have been referenced in synthetic CDOs created by other firms. Finally, when the housing bubble popped and crisis followed, derivatives were in the centre of the storm. AIG, which had not been required to put aside capital reserves as a cushion for the protection it was selling, was bailed out when it could not meet its obligations. The government ultimately committed more than \$180 billion because of concerns that AIG's collapse would trigger cascading losses throughout the global financial system. In addition, the existence of millions of derivatives contracts of all types between systemically important financial institutions –unseen and unknown in this unregulated market– added to uncertainty and escalated panic, helping to precipitate government assistance to those institutions.

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