

## **Financial Crisis 2007-2009 how credit rating agencies, mark to market and shadow banking system generated and worsen the crisis?**

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This Paper seeks to explain some main factors behind the Financial Crisis 2007-2009 with a special focus on the Credit Rating Agencies, Mark to Market and Shadow Banking System, 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 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.

**Shadow Banking System, Mark to Market, Collateralized Debt Obligation (CDO), Generally Accepted Accounting Principles (GAAP), Credit Rating Agencies**

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## Introduction

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 19th century crises and those in the late 20th 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.

“The classic explanation of financial crises, going back hundreds of years, is that they are caused by excesses—frequently monetary excesses—which lead to a boom and an inevitable bust.

In the recent crisis we had a housing boom and bust which in turn led to financial turmoil in the United States and other countries” (Taylor, 2008).

The term financial crisis is applied broadly to a variety of situations in which some financial institutions or assets suddenly lose a large part of their value. In the 19th and early 20th centuries.

Many financial crises were associated with Banking Panics and many recessions coincided with these panics.

The current tsunami in financial markets, which is believed to have been triggered by the collapse of the sub-prime housing market, has refocused the ideas of Hyman Minsky (1919–1996), a prominent member of the post-Keynesian school of economics. Many commentators are of the view that Minsky accurately anticipated the current financial crisis. (Wray, 2007) (McCauley, 2008). Some of them called this situation a “Minsky moment” (Whalen 2007, Magnus 2007).

This Crisis has many things in common like the previous Crises but there are some new things also. Especially some new financial innovations were also in the root cause of the crisis. From Housing Bubble to Mark and Market and Global imbalances all participated in the crisis. But the main focus of this paper is on the least discussed Causes which I believe were the main culprit of the Crisis.

Apart from the introduction the paper has been divided into four main parts.

First we would discuss the Credit Rating Agencies their structure, functions and how they participated in the Financial Crises. Secondly the Mark to Market rules of Accounting and how this rule created mess in the market.

Thirdly Shadow Banking System, how it works and what’s its size and how it generated and worsens the crisis.

Finally after some empirical analysis we would draw some conclusions.

### Credit rating agencies

*The U.S. subprime residential mortgage debacle of 2007-2008, and the world financial crisis that has followed, will surely be seen as a defining event for the U.S. economy -- and for much of the world economy as well -- for many decades in the future.*

*Among the central players in that debacle were the three large U.S.-based credit rating agencies: Moody's, Standard & Poor's (S&P), and Fitch.*

*Lawrence j. White (2009)*

John Moody published the first publicly available bond ratings (mostly concerning railroad bonds) in 1909. Moody's firm was followed by Poor's Publishing Company in 1916, the Standard Statistics Company in 1922, and the Fitch Publishing Company in 1924. These firms' bond ratings were sold to bond investors, in thick rating manuals.

A central concern of any lender -- including investors in bonds -- is whether a potential or actual borrower is likely to repay the loan (including any specified interest). Lenders therefore usually spend considerable amounts of time and effort in gathering information about the creditworthiness of prospective borrowers and also in gathering information about the actions of borrowers after loans have been made.

The credit rating agencies offer judgments -- they prefer the word "opinions" -- about the credit quality of bonds that are issued by corporations, governments (including U.S. state and local governments, as well as "sovereign" issuers abroad), and (most recently) mortgage securitizers. These judgments come in the form of ratings, which are usually a letter grade.

In fact, the rating business has not been profitable until mid-1990s when the financial institutions began to use credit derivatives such as credit default swap and collateralized debt obligation to free up balance-sheet capital requirements and transfer credit risk Partnoy (2006).

This led the major credit rating agencies to increasingly expand their business to include the rating of complex debt instruments, particularly collateralized debt obligation (CDO).

This rating methodology along with a less regulated environment enabled three agencies to enjoy a multi-trillion dollar oligopoly market. However as credit rating agencies aggressively expand their rating methods issues arise around the trustworthiness of credit rating Liu (2007).

Rating scales: The best known scale is that used by S&P and some other rating agencies: AAA, AA, A, BBB, BB, etc., with pluses and minuses as well White (2009).

<b>S&amp;P and Fitch use the same Scale</b>	
<b>Investment Grade</b>	
AAA	The best Quality borrowers, Reliable and Stable
AA	Quality borrowers, a bit higher risk than AAA
A	Economic Situation can affect borrower's ability to pay
BBB	Medium class borrowers, satisfactory at the moment
<b>Speculative Grades</b>	
BB	Borrower's ability to pay is more prone to changes in the economy
B	Borrower's Financial Situation varies noticeably

CCC	Borrower is currently vulnerable and dependent on favourable economic conditions to meet its commitments
CC	Borrower is highly vulnerable
C	Borrower may be in bankruptcy but is still paying its obligations
D	Borrower has defaulted on obligations and CRA believes that it will generally default on most or all obligations
<b>MOODY'S SCALE VARIES SLIGHTLY</b>	
Investment Grade	From AAA to BAA3
Speculative Grade	From Ba1 to C, (C being in default)

Table 1

### Conflict of interest

Partnoy (2006) points out that the credit rating industry presents strong conflicts of interests as result of the fact that as much as 90 percent of agencies' revenues are from the fees directly paid by the issuers they rate.

He then goes on to argue that these agencies' complex and opaque methodologies for rating CDOs create arbitrage opportunities, motivating the rapid expansion of CDO market.

Since the agencies were receiving substantial payments for this service, it created a clear conflict of interest. If CDO issuers did not get the rating they wanted, they could try another agency, taking their fees with them – an act known as “ratings shopping.” Baily, Litan etc. (2007).

According to the New York Times, Moody's profits tripled between 2002 and 2006 to \$750 million, mostly because of the fees from structured finance products. According to Coval et al (2008), fees from structured finance products made up 44 percent of Moody's revenue in 2006. Moody's net income rose from \$289 Million in 2002 to \$754 Million 2006. (Economist, 06 sep. 2007)

In 2006, 79.3% of an average subprime MBS was rated AAA. CDOs were similar – often 95% of a CDO was rated investment grade as shown in below figure-36. In July 2008, the SEC concluded that the CRAs failed to manage conflicts of interest between MBS and CDO issuers and the CRAs. CRAs were supposed to serve investors, but conflicts of interest led some CRAs to cater to MBS and CDO issuers by inflating ratings Amanda (2009).

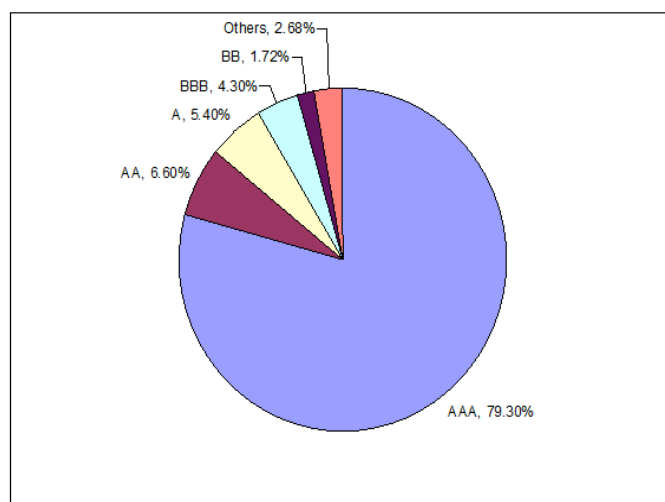


Figure 1

Conflicts of interest were caused by:

1. Relationship conflicts: CRAs have had a close, ongoing working relationship with the largest MBS and CDO issuers;
2. Issuer-paid ratings: 98% of the ratings produced by the CRAs have been paid for by issuers, not investors. The pay incentive led some CRAs to try to inflate ratings of paying issuers in hopes of gaining repeat business from those issuers; and
3. Advising-rating combination: CRAs advised issuers on how to structure MBSs and CDOs to get high ratings.

Then CRAs “confirmed” that advice by issuing the “promised” ratings.

How CRA creates crisis? From 2007 to 2008, rating agencies lowered the credit ratings on \$1.9 trillion in mortgage backed securities. Financial institutions felt they had to lower the value of their MBS and acquire additional capital so as to maintain capital ratios. If this involved the sale of new shares of stock, the value of the existing shares was reduced. Thus ratings downgrades lowered the stock prices of many financial firms.

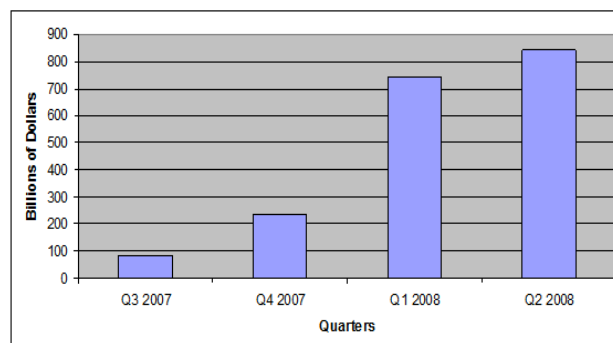


Figure 2

Figure-2 above shows how Mortgage-Backed Securities has been downgraded from Q3 2007 to Q2 2008. In Q3 2007 less than \$100 Billions MBS has been downgraded while in Q2 2008 only after nine months almost \$850 Billion MBS downgraded. This figure shows the real work of Credit Rating Agencies. This situation creates panic in the market which ultimately led to crisis.

As CRAs downgraded their highest-rated instruments, investors wondered if any investments were safe. This uncertainty caused the credit markets to freeze. Suddenly, few wanted to invest in even the highest-rated instruments for fear they would be downgraded.

Many wanted to rid themselves of their current investments. The ongoing crisis has shown that ratings can be inaccurate, untimely, and affected by CRA conflicts of interest. Many market participants no longer trust the ratings that CRAs produce (Amanda Bahena).

Critics allege that the rating agencies suffered from conflicts of interest, as they were paid by investment banks and other firms that organize and sell structured securities to investors. On 11 June 2008, the SEC proposed rules designed to mitigate perceived conflicts of interest between rating agencies and issuers of structured securities.

Erik Sirri, Director of the SEC's Division of Trading and Markets, said, "The rules proposed today are designed to improve investor understanding of credit ratings through enhanced disclosure of NRSRO methods and performance data, and to promote investor confidence in credit ratings by minimizing conflicts of interest." Although SEC takes steps to regain the investors trust but it seems that it's too late and damage has already been done.

Mark to market: The market for mortgage-backed securities and related financial instruments has collapsed over the past year, leading to massive write-downs and the failure of several major investment banks and consumer lenders. Some blame fair value (Mark to Market) for unduly distorting the health of:

- 1 Prohibit a credit rating agency from issuing a rating on a structured product unless information on assets underlying the product was available
- 2 Prohibit credit rating agencies from structuring the same products that they rate.
- 3 Require credit rating agencies to make all of their ratings and subsequent rating actions publicly available. This data would be required to be provided in a way that will facilitate comparisons of each credit rating agency's performance. Doing this would provide a powerful check against providing ratings that are persistently overly optimistic, and further strengthen competition in the ratings industry
- 4 Attack the practice of buying favourable ratings by prohibiting anyone who participates in determining a credit rating from negotiating the fee that the issuer pays for it.
- 5 Prohibit gifts from those who receive ratings to those who rate them, in any amount over \$25.
- 6 Require the public disclosure of the information a credit rating agency uses to determine a rating on a structured product, including information on the underlying assets. That would permit broad market scrutiny, as well as competitive analysis by other rating agencies that are not paid by the issuer to rate the product
- 7 Require credit rating agencies to publish performance statistics for 1, 3, and 10 years within each rating category, in a way that facilitates comparison with their competitors in the industry

- 8 Require disclosure by the rating agencies of the way they rely on the due diligence of others to verify the assets underlying a structured product.
- 9 Require disclosure of how frequently credit ratings are reviewed; whether different models are used for ratings surveillance than for initial ratings; and whether changes made to models are applied retroactively to existing ratings.
- 10 Require credit rating agencies to make an annual report of the number of ratings actions they took in each ratings class, and require the maintenance of an XBRL database of all rating actions on the rating agency's Web site. That would permit easy analysis of both initial ratings and ratings change data
- 11 Require documentation of the rationale for any significant out-of-model adjustments

*Companies' balance sheets and contributing to a negatively reinforcing downward spiral, and they have called for the SEC to suspend fair value accounting.*

*(CPA Journal, Jan 2009).*

Mark-to-market or fair value accounting refers to the accounting standards of assigning a value to a position held in a financial instrument based on the current fair market price for the instrument or similar instruments.

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For understanding consider that a futures trader, when taking a position, deposits money with the exchange, called a "margin". This is intended to protect the exchange against loss. At the end of every trading day, the contract is marked to its present market value. If the trader is on the winning side of a deal, his contract has increased in value that day, and the exchange pays this profit into his account. On the other hand, if the market price of his contract has declined, the exchange charges his account that holds the deposited margin. If the balance of this account falls below the deposit required to maintain the position, the trader must immediately pay additional margin into the account to maintain his position (a "margin call").

Fair value accounting has been a part of US Generally Accepted Accounting Principles (GAAP) since the early 1990s. The use of fair value measurements has increased steadily over the past decade, primarily in response to investor demand for relevant and timely financial statements that will aid in making better informed decisions. Mark to Market was introduced in 1993 after the S&L crisis, when then backward-looking GAAP accounting standards prolonged the crisis by allowing many thrifts to appear solvent on their books, even though their equity had effectively been wiped out.

An interesting early study on the relevance and implications from Mark to Market was performed by Bernard, Merton and Palepu (1995).

For many years, Denmark's accounting standard-setting and banking regulatory authorities have relied on Mark to market valuation for the assets of their commercial banks (Bernard, Merton and Palepu (1995)).

They find that Danish banks book values, which reflect mark to market valuations, seem to provide more reliable information to investors than historical cost-based figures then provided by U.S banks.

They do not find evidence that Danish bank executives manipulate mark to market numbers to circumvent regulatory capital ratios.

However they also point out that Danish and US capital Markets are not quite similar and their findings may not completely hold in a U.S setting.

For almost two decades Mark to Market was the best system of providing investors with the reliable information. But as the crisis struck the financial system some economists lift finger towards this Mark to market system of accounting for deepening the turmoil in the financial markets.

According to Peter Needleman (2008) "There is a powerful argument that this is a crisis which has been turned into a disaster by mark to market accounting rules". Chief Economist Brian S. Wesbury and his colleague Bob Stein at First Trust Portfolios of Chicago estimate the impact of the "mark-to-market" accounting rule on the current crisis as follows:

"It is true that the root of this crisis is bad mortgage loans, *but probably 70% of the real crisis that we face today is caused by mark-to-market accounting in an illiquid market.* What's most fascinating is that the Treasury is selling its plan as a way to put a bottom in mortgage pool prices, tipping its hat to the problem of mark-to-market accounting without acknowledging it. It is a real shame that there is so little discussion of this reality."

A study by Barth, Landsman and Whalen (1995) shows that fair Value based measures of net income are more volatile than historical cost based measures.

According to Gingrich (2008) when a company in financial distress begins fire sales of its assets to raise capital to meet regulatory requirements, the market-bottom prices it sells out for become the new standard for the valuation of all similar securities held by other companies under mark-to-market. This has begun a downward death spiral for financial companies large and small.

During Financial Crisis, many of the Mortgage Backed Securities that were behind the financial crisis having no market and hence almost impossible to assign a fair value. Because of their perceived risk and unknown exposure nobody wants them and in many cases if there is no demand they become worthless (\$0 value).

This obviously was not true. Even if the value is 5 cents on the dollar, they still had a value. But the securities were so complex and the economic environment so uncertain, that nobody was willing to "stick their neck out" and try to pick the correct price.

Moreover foreclosures and home auctions continued to depress housing prices, further reducing the value of all mortgage-related securities.

As capital values decline, firms scrambled to maintain the capital required by regulation. When they try to sell assets to raise that capital, the market values of those assets were driven down further. Under mark-to-market, the company had to mark down the value of all of its assets even more.

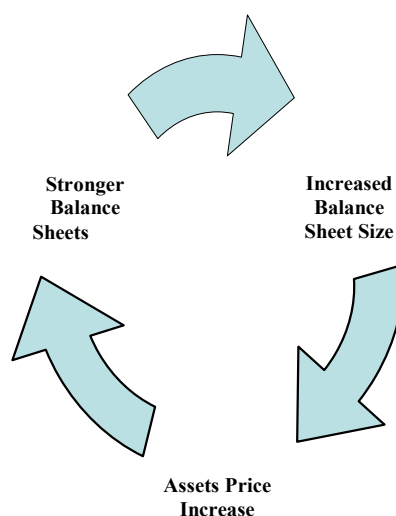
The credit agencies saw declining capital margins, so they downgraded the company's credit ratings. That made borrowing to meet capital requirements more difficult. Declining capital and credit ratings caused the company's stock prices to decline further.

Leverage adjustments and MtoM: Panic prevailed, and no one wanted to buy mortgage-related securities, which derived their value under mark-to-market regulations down toward zero. Balance sheets under mark-to-market suddenly started to show insolvency.

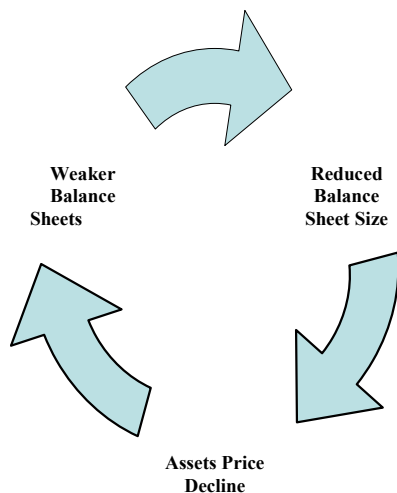
This downward spiral shuts down lending to these companies, so they lose all liquidity (cash on hand) needed to keep company operations going. Stockholders--realizing that they will be wiped out if the companies go into bankruptcy or get taken over by the government--start panic selling, even when they know the underlying business of the company is fine.

This vicious circle transfers the panic into crisis and crisis into disaster. Figure-3 shows how the liquidity increased or decreases the size of Balance Sheet.

#### Leverage Adjustment in Upturn





**Leverage Adjustment in Downturn****Figure 3**

If financial markets are not perfectly liquid so that greater demand for the asset tends to put upward pressure on its price, then there is the potential for a feedback effect in which stronger balance sheets feed greater demand for the asset, which in turn raises the asset's price and lead to stronger balance sheets.

Figure above illustrates the feedback during a boom. The mechanism works exactly in reverse in downturns.

In a financial system where balance sheets are continuously marked to market, asset price changes show up immediately as changes in net worth, and elicit responses from financial intermediaries who adjust the size of their balance sheets.

On the asset side, traded assets are valued at market prices, or are short term collateralized loans for which the discrepancy between face value and market value are very small due to the very short term nature of the loans. On the liabilities side, short positions are at market values.

Long-term debt is typically a small fraction of the balance sheet for investment banks.

For these reasons, investment banks provide a good approximation of the balance sheet that is continuously marked to market, and hence provide insights into how leverage changes with balance sheet size.

When expressed as a proportion of commercial banks' balance sheets, securities firms have been increasing their balance sheets at a very rapid rate.

Note that when hedge funds' assets under management is converted to balance sheet size by multiplying by a conservative leverage factor of 2, the combined balance sheets of investment banks and hedge funds is over 50% of commercial banks balance sheets.

According to Ryan (2008) during the Financial Crisis, the markets for subprime become severely illiquid and disorder. This has led various parties to raise three main potential criticisms on fair value accounting.

First, unrealized losses recognized under fair value accounting may reverse over time. Second, market illiquidity may render fair values difficult to measure and thus unreliable. Third, firms reporting unrealized losses under fair value accounting may yield adverse feedback effects that cause further deterioration of market prices and increase the overall risk of the financial system referred as "systemic risk".

**Effects of mark to market**

Due to Mark to market we have seen that during the crisis Bradford & Bingley's management announced to write-down of more than \$500 Million on a range of its SIVs.

CDOs and hedging instruments on the views of its Auditors although the management says it did not agree with the auditors. AIG raised estimated losses on mortgage-related instruments from \$1 Billion to \$5 Billion.

Their auditors claimed that there was material weakness in the way that the insurer valued its exposure which has been ratified now. But things clear that the auditors forced AIG to mark to market at valuation provided by a US investment bank.

Credit Suisse management reveals a \$1 Billion hit to its first quarter profits, just a few days after telling investors at its full year 2007 results presentation that the bank survived the credit crunch. All these three incidents showed that the present crisis in financial markets is not just about credit losses. For many firms with exposure to the credit markets, mark to market is becoming almost as unpopular as sub-prime. Marking to market when no real market exists can seem nonsensical, especially when the asset is performing Euromoney (2008).

MBIA has posted mark to market losses of nearly \$ 3.5 Billion on CDS contracts. AIG lost some \$15.1 Billion (More than 10 %) on its share price following the auditor's intervention. Bradford & Bingley's share price fell by more than 20% because of write-downs Euromoney (2008).

Hence it can be put forward that Mark to market through its magnifying impact on earnings volatility, may have contributed to aggravate investors, regulators, and government's perceptions with respect to the severity of the crisis, itself characterized by record volatility in the prices of many securities and goods. (Michel Magnan, 2009)

How mark to market caused crisis: According to Magnan (2009) These cases raises the issue of FVA or Mark to market applicability as it is being extended from instruments traded in liquid and organized markets to credit type instruments that are often securitized and which are not quite transparent about their underlying assets.

Key criticism against FVA is that its use in the current crisis has led to a reduction in the value of financial institutions assets, which translated into a severe shrinking of their capital ratios, forcing them to deleverage and sell further assets at distressed prices, thus feeding the downward spiral.

In words of Gingrich (2008) "So, mark-to-market accounting contributes both to credit bubbles, which no one on Wall Street ever complains about because they are too busy raking in the cash, and credit busts, at which point, something must be done. If regulators on their own--or Congress.

If regulators fail to use their discretion--can fix 70% of the financial crisis by changing the mark-to-market accounting rule, we should change the rule first before attempting to pass another reevaluated bailout package"

But the big question is to change Mark to market with whom? Although Mark to Market play its part in the Financial Crisis it seems impossible to eradicate this accounting system from the financial Institutions. As Andrew Leonard (2008) truly highlights the situation "There's just one big fat honking problem. If mark-to-market rules are suspended, what replaces them? Surely we don't trust the owners of these risky assets to decide for themselves what they're worth"

Many academics, argue that there is no alternative measurement or reporting model.

For example Barth (2007) a member of international Accounting standards Board, argues that “Although opponents of more comprehensive use of fair value have some legitimate concerns, standard setters are unaware of a plausible alternative”. Michael Magnan (2009) sums up the whole debate in the following words” The debate goes further than accounting and financial reporting and deals with the essence of what accountants are expected to contribute to society and, implicitly, what competences and skills they must possess to deliver in that regard. One may surmise that current accounting standards, such as those relating to fair value, probably overstretch accountants’ capabilities and prior learning and obscure other informational needs by investors and other interested stakeholders.”

### Shadow banking system

*Financial Crisis 2007-2009 was a crisis of traditional banks and, more important, a crisis of the so-called shadow banking sector—that is, of those financial institutions that mostly looked like banks.*

*Acharya, Philippon etc.( 2008)*

The Shadow Banking System or the shadow financial system consists of non-bank financial institutions that play an increasing critical role in lending business the money necessary to operate. These financial institutions are typically intermediaries between investors and borrowers. By definition shadow institutions don’t accept deposits like depository bank and therefore are not subject to the same regulations. Examples include Bear Stearns and Lehman Brothers. Other complex legal entity comprising the system includes hedge funds, SIVs, Conduits, Money Funds, Monolines and Investment Banks. Banks grant loans with the resources they receive from depositors and with their own capital.

Above all, however, they create deposits – scriptural currency – by granting credit Keynes (1930). They also issue debts in order to raise resources and to grant new loans Chick (1986). According to McCulley (2007), executive director of the largest resource manager in the world.

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*The term "shadow banking system" used first time by Paul Allen McCauley. He used this term in 2007 at Jackson Hole conference, where he defined it as "the whole alphabet soup of levered up non-bank investment conduits, vehicles, and structures." He coined the term Minsky moment and Shadow banking system which became famous during the financial crisis of 2007-2009. Prior to joining PIMCO in 1999, he was chief economist for the Americas at UBS Warburg. During 1996-98, he was named to six seats on the Institutional Investor All-America fixed-income research team. He has 25 years of investment experience and holds an M.B.A. from Columbia Business School. He received his undergraduate degree from Grinnell College. McCauley adheres to Keynesian economics, and was particularly influenced by Hyman Minsky.*

Pimco, the global shadow banking system includes all agents involved in leveraged loans which do not have (or did not have, according to the rule in force before the outburst of the crisis) access to deposit insurances and/or to rediscount operations of central banks. These agents are not subject to the prudential regulations of the Basel Agreements Cintra & Prates(2008) and Freitas (2008). Table-2 below shows the impact of the crisis on the Banking Industry. Although the banking industry as a whole has seen a dramatic slowdown in terms of profitability and a rise in non-current assets and other real estate owned or “OREO” and the performance numbers for all banks are clearly deteriorating, but the industry is not yet near a crisis like the Shadow Banking Industry.

	2007	2006	2005	2004	2003	2002	2001
Return on Assets (%)	0.86	1.28	1.28	1.28	1.38	1.3	1.14
Return on Equity (%)	8.17	12.3	12.43	13.2	15.05	14.08	13.02
Core Capital Leverage Ratio (%)	7.98	8.22	8.25	8.11	7.88	7.86	7.79
Non-current Assets plus OREO(%)	0.94	0.54	0.5	0.53	0.75	0.9	0.87
Net Charge-offs to loans (%)	0.59	0.39	0.49	0.56	0.78	0.97	0.83
Net operating income growth%	-23.72	8.5	11.39	4.02	16.39	17.58	-0.48

**Table 2**

Shadow institutions borrowed short-term in rollover debt markets, leveraged significantly, and lent and invested in longer-term and illiquid assets.

However, unlike banks, they did not have access until 2008 to the safety nets—deposit insurance, as well as the lender of last resort (LOLR), the central bank—that have been designed to prevent runs on banks Acharya, Philippon etc. (2008)

According to Farhi (2008) between June 2007 and November 2008, there were many especially dramatic events in the course of the crisis, with strong impacts on the global interbank markets.

These moments were mirrored in the behavior of the so-called TED spread – the difference between the rate of the three-month US Treasury papers (on the secondary market) and the Libor rate (London Interbank Offered Rate) for three-month deposits in Eurodollars – an international reference for interbank loans, estimated at US\$ 23.3 trillion in March 2008 by the Bank for international Settlements (BIS).

In spite of the steep fall of the US basic interest rate and the combined reduction of the interest rates in the main developed economies in October and November 2008, the spread between the US Treasury Bills and the Libor rate remained at a high level.

### **Shadow banking and financial crisis**

According to Roubini (2008) a generalized run on these shadow banks started when the asset bubble bust led to uncertainty about which institutions were solvent. Roubini (2008) described the meltdown of the Shadow Banking System in following stages:

The first stage was the collapse of the entire SIVs/conduits system once investors realized the toxicity of its investments and its very short-term funding seized up.

The next step was the run on the big US broker-dealers: first Bear Stearns lost its liquidity in days. The Federal Reserve then extended its lender-of-last-resort support to systemically important broker-dealers.

But even this did not prevent a run on the other broker-dealers given concerns about solvency: it was the turn of Lehman Brothers to collapse. Merrill Lynch would have faced the same fate had it not been sold.

The pressure moved to Morgan Stanley and Goldman Sachs: both would be well advised to merge – like Merrill – with a large bank that has a stable base of insured deposits.

The third stage was the collapse of other leveraged institutions that were both illiquid and most likely insolvent given their reckless lending: Fannie Mae and Freddie Mac, AIG and more than 300 mortgage lenders.

The fourth stage was panic in the money markets. Funds were competing aggressively for assets and, in order to provide higher returns to attract investors, some of them invested in illiquid instruments.

Once these investments went bust, panic ensued among investors, leading to a massive run on such funds.

This would have been disastrous; so, in another radical departure, the US extended deposit insurance to the funds.

### Conclusions:

Credit Rating Agencies contributed toward financial crisis. All the three Credit Rating Agencies contributed. Especially Moody which alone has 45000 mortgage-related securities rated as AAA.

In 2006 alone, Moody's put its triple-A stamp of approval on 30 mortgage-related securities every working day. The results were disastrous: 83% of the mortgage securities rated triple-A that year ultimately were downgraded.

Forces at work behind the breakdowns at Moody's, including the flawed computer models, the pressure from financial firms that paid for the ratings, the relentless drive for market share, the lack of resources to do the job despite record profits, and the absence of meaningful public oversight.

And you will see that without the active participation of the rating agencies, the market for mortgage-related securities could not have been what it became.

Financial institutions and credit rating agencies embraced mathematical models as reliable predictors of risks, replacing judgment in too many instances. Too often, risk management became risk justification.

Mark-to-market accounting contributes both to credit bubbles, which no one on Wall Street ever complains about because they are too busy raking in the cash and credit busts.

Key criticism against Mark to Market or FVA is that its use in the current crisis has led to a reduction in the value of financial institutions assets, which translated into a severe shrinking of their capital ratios, forcing them to deleverage and sell further assets at distressed prices, thus feeding the downward spiral.

In 2007, the five major investment banks—Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch, and Morgan Stanley—were operating with extraordinarily thin capital. By one measure, their leverage ratios were as high as 40 to 1, meaning for every \$40 in assets, there was only \$1 in capital to cover losses.

Less than a 3% drop in asset values could wipe out a firm. To make matters worse, much of their borrowing was short-term, in the overnight market—meaning the borrowing had to be renewed each and every day.

For example, at the end of 2007, Bear Stearns had \$11.8 billion in equity and \$383.6 billion in liabilities and was borrowing as much as \$70 billion in the overnight market.

It was the equivalent of a small business with \$50,000 in equity borrowing \$1.6 million, with \$296,750 of that due each and every day.

In 20th century, there were so many protections like Federal Reserve as a lender of last resort and FDIC which were responsible for regulation to provide the protection against the panics.

But over thirty years plus permission to growth of Shadow Banking system has narrowed the size of commercial Banks. Shadow banking system was permitted to grow to rival the commercial banking system with inadequate supervision and regulation.

That system was very fragile due to high leverage, short-term funding, risky assets, inadequate liquidity, and the lack of a federal backstop.

When the mortgage market collapsed and financial firms began to abandon the commercial paper and repo lending markets, some institutions depending on them for funding their operations failed or, later in the crisis, had to be rescued.

These markets and other interconnections created contagion, as the crisis spread even to markets and firms that had little or no direct exposure to the mortgage market. In addition, regulation and supervision of traditional banking had been weakened significantly, allowing commercial banks and thrifts to operate with fewer constraints and to engage in a wider range of financial activities, including activities in the shadow banking system.

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