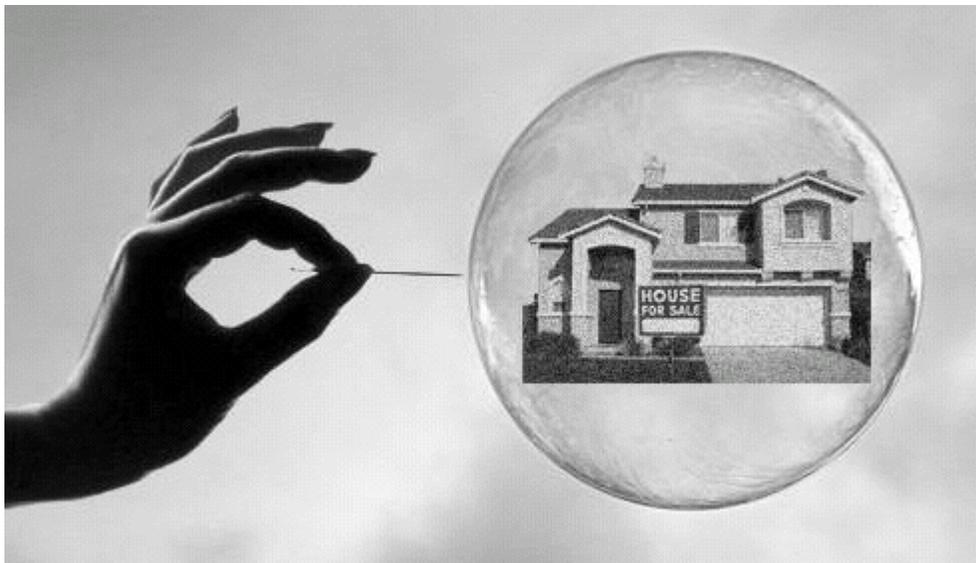


The Subprime Credit Crisis

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Executive Summary

Denne afhandling indeholder en analyse af Subprime Kredit Krisen (SKK) på et makro såvel som på et mikro niveau. Ydermere, finder læseren en analyse af den Amerikanske Centralbanks - Federal Reserves (Fed) - rolle og indgriben i den finansielle krise i henhold til dens kontinuerlige forsøg på at forhindre en såkaldt "Debt Deflation" cyklus – og dermed en depression fra at forekomme.

Minsky-Kindleberger modellen danner det teoretiske fundament for analysen på makro niveauet. Analysen viser at finansiell innovation er den udløsende faktor bag SKK og det er samspillet af væsentlige faktorer, bl.a. det lave renteniveau og boligboblen, der udgjorde hændelserne op til krisens udbrud.

Subprime långiveres og låntageres adfærd samt deres rolle i SKK bliver analyseret dybere i mikro niveauet ved hjælp af relevant teori, herunder "Bubble Psychology" af Werner De Bondt (2003). Långiverne har i forbindelse med SKK til dels handlet kulpøst i deres søgen efter profit. Ydermere kan deres adfærd karakteriseres for irrational i forbindelse med deres forventninger til huspriserne og rationel i henhold til låntagernes irrationalitet, finansielle analfabetisme og høje efterspørgsel efter subprimelån. Låntagernes irrationalitet bygger ligeledes på deres forventninger til huspriserne, deres antagelse om at spekulere uden at lide tab samt deres fokus på de månedlige ydelser fremfor i højere grad at basere deres valg af lån på renteniveauet og lånets totale omkostninger. Det medførte at långiverne designede de såkaldte rentetilpasningslån med indledende lave renter som efter en periode på typisk to til tre år blev sat op til et betydeligt højere niveau. Det viste sig naturligvis at låntagerne ikke var i stand til at betale de høje renter og da boligboblen sprang var denne model ikke længere holdbar.

En analyse af Fed er foretaget på baggrund af de aktioner som centralbanken har anvendt i bestræbelserne på at dæmme op for krisen og forhindre en forværring af den generelle økonomiske situation. Disse responser er så blevet brugt som udgangspunkt til en diskussion af brugen af de tre teorier som blandt andet er gengivet af Michael Bordo (1990).

Overordnet har responserne båret præg af at Fed har vist en høj grad af eftergivenhed i definition af sikkerhed på låneudstedelser. Samtidig er insolvente såvel som ilikvide blevet hjulpet, hvilket peger i retning af at Fed i øjeblikket udelukkende fokuserer på de finansielle markeders stabilitet på bekostning af risikoen for fremtidig systemisk risiko.

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1 Introduction

Major historical financial crises have often had their origins in the US economy. Prime examples being the Wall Street Crack of 1929, the Savings & Loan Debt Crisis of 1985 and the burst of the dotcom bubble in 2000. This is believed, by many leading economists, to be due to the fast development of the capitalistic economy of the USA.

Today a relatively new financial crisis - the Subprime Credit Crisis (SCC) - is wreaking havoc in the world economy. It is characterized by having originated in the US subprime mortgage sector where the burst of the housing bubble has caused distressed home owners to default on their mortgages in a grand scale. Due to contagion the crisis has spread rapidly to a large part of the world's economic markets.

It is believed that leading economists and economic institutions have anticipated the occurrence of a financial crisis but there resides great uncertainty on whether there was a lack of effort in trying to prevent the crisis.¹ Furthermore, there are obvious indications that the real estate bubble – believed to be one of the main factors to have triggered the crisis² - succeeded the dotcom bubble as investors shifted their speculation from commodities to real estate.

The Federal Reserve (Fed) serves as a Central Bank and a lender of last resort (LOLR) in the US. The main purpose of this institution is to protect the US economy from failing; hence it plays a vital role in times of financial crisis. During these times the Fed tries to ameliorate the distress by the use of monetary policy.

An economy that enters a financial crisis is not the same as the one that manages to get through it. Moreover, a financial crisis itself is not the actual problem but more a beginning to a solution. It emerges due to the fact that something is not right in the economy and changes have to be made in order for it to continue to work optimally. Therefore, in order to be able to minimize not only current losses but also the probability of the occurrence of future financial crisis it is of utmost importance to achieve an understanding of the reasons behind the SCC.

There is consensus in the media today that the SCC will lead to a recession. Furthermore, some economists are of the opinion that the upcoming recession can exceed the one following the Crack of 1929.³ The SCC may or may not reach the levels of past financial crises but it will certainly change the future economy of USA - only time will tell how.

¹ Goodhart, Charles A. E., "The background to the 2007 financial crisis", Springer-Verlag, February 19, 2008

² Lahart, Justin, "Egg Cracks Differ In Housing, Finance Shells", Wall Street Journal, December 24, 2007

³ "Greenspan Says Fed Didn't Cause Housing Bubble", CNBC.com, April 8, 2008

2 Literature Review

This chapter is dedicated to shedding some light on the general literature on the subject of financial crises and the role of the LOLR. This overview shall pave the way for a recap on the works s the ongoing SCC and the issue of the LOLR in connection with this crisis.

The first section of this chapter examines relevant theory on financial crises on the macro-level, selected theories on a micro-level and theory on the LOLR. The second part will examine the empirical literature so far on the ongoing crisis and the measures taken by the Fed in coping with the SCC.

2.1 *Theory on Financial Crises*

In broad outline there exist two schools of thought on the research on financial crises: the Business Cycle School and the Monetary School. The views on and definitions of financial crises from these schools will be outlined in the following.

2.1.1 Business Cycle Theory

The fundamentals of the Business Cycle Theory were laid by early economists such as Adam Smith, Karl Marx, John M. Keynes, Joseph A. Schumpeter and Irving Fisher. Nowadays, Hyman Philip Minsky and Charles P. Kindleberger are considered to be the main “modern” contributors to this school of thought on financial crises.

2.1.1.1 Debt-Deflation Theory

In light of the Great Depression of 1929 Fisher published his ground breaking theory entitled “*The Debt-Deflation Theory of Great Depressions*” in 1933. At the time of the publishing of the theory many economists overruled his statements because of his personal economical failure after the Crash of 1929. It was not before the 1970’s that the theory began to receive wide recognition via economists such as Minsky and James Tobin beginning to delve on the stability of the financial system. Today the Debt-Deflation Theory is recognized as being one of the most influential theories to the economy. The Minsky-Kindleberger model even incorporates Fisher’s Debt-Deflation theory as an essential point in the examination of financial crises.

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With this theory Fisher (1933) aimed at isolating and explaining the factors that determine whether or not an economy enters a period of depression. He accentuates the interrelation between nine “chief factors” and herein isolated the following two factors as being prerequisites for a crisis and a following depression: over-indebtedness and price deflation. He further explains the relation between these two factors:

“When over-indebtedness stands alone, that is, does not lead to a fall of prices... the resulting cycle will be far milder and far more regular. (...) It is the combination of both – the debt disease coming first, then precipitating the dollar disease – which works the greatest havoc.” (Fisher, 1933, p. 344)

He compares this interrelation with *“a bad cold that may lead to pneumonia, so over indebtedness leads to deflation”* (Fisher, 1933, p. 31).

In regards to the rest of the chief factors Fisher emphasizes that these factors cannot bring on a depression on their own. In short, it is in interaction with the two main factors – over-indebtedness and price deflation – that an economic disaster can occur.

Over-indebtedness is mainly caused by the easy access to money (Fisher, 1933, p. 348). He further elaborates:

“When an investor thinks he can make over 100 per cent per annum by borrowing at 6 per cent, he will be tempted to borrow, and to invest or speculate with borrowed money.” (Fisher, 1933, p. 348)

Fisher emphasizes that over-indebtedness should be viewed in relation to national wealth, income and the gold supply (Fisher, 1933, p. 345). The latter is not relevant today as exchange rates are no longer locked to the gold standard but it is instead central banks that control the size of the money supply – an advantage in an effort of fighting inflation and minimizing the probability of the occurrence of a depression.

In a heavily indebted economy debtors and creditors are in too much risk. In this state the confidence is at a very low level, affecting debtors in such a way that they might be stimulated to sell assets in order to liquidate their debt partly. This leads to distress selling that precipitates the contraction of deposit currency as loans are paid off, subsequently slowing down the circulation of

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money through the system. In turn the events lead to price deflation (Fisher, 1933, p. 342). Along with the decreasing price level a crucial cycle is set off:

“(...) the liquidation of debts cannot keep up with the fall of prices which it causes. In that case, the liquidation defeats itself. (...) Then, the very effort of individuals to lessen their burden of debts increases it, because of the mass effect of the stampede to liquidate in swelling each dollar owed. (...) The more the debtors pay, the more they owe.” (Fisher, 1933, p. 344)

Businesses witness their net worth diminish whilst some go bankrupt. Amongst the surviving there occurs reduction and cutbacks. The confidence level is now at a very low level and the public starts hoarding currency which further slows down the circulation of money. The course of events finally leads to disturbances in the interest rates (Fisher, 1933, p. 342).

An over-indebted economy behaves similarly to a capsizing ship. Following a disturbance the ship is constructed to right itself. Once tipped beyond a certain point it tends to move away from equilibrium. In relation to the economy the capsizing is over when:

“This is the so-called “natural” way out of a depression, via needless and cruel bankruptcy, unemployment, and starvation.” (Fisher, 1933, p. 346)

However, he accentuates that, if the model holds, a depression can be prevented via a reflation of the price level back to equilibrium.

2.1.1.2 The Minsky-Kindleberger Approach

According to Kindleberger (2005) there is a close relation between cyclical movements in the economy and financial crises. His theory is generally based on analyses on historical financial crises. Moreover, Kindleberger points to the fact that overtrading plays a vital role in the occurrence of financial crises but his theoretical foundation is based on Minsky.

The chain of events leading to a crisis begins during a boom (Kindleberger, 2005). At this stage new investment possibilities arise in some segments in the economic playing field, thus investments and prices increase. This produces profit which again leads to new investments and subsequently

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speculation in specific assets. This behavior highly resembles irrationality. However, according to Kindleberger the public reacts rationally on the market information because future forecasts/expectations during the boom predict increasing profit opportunities.

The boom is often financed by banks through credit expansion thus bringing with it an increasing level of debt financing. A period of financial distress subsequently follows the boom and uncertainty about the debtors' ability to meet their obligations arises. A liquidity crisis can thereafter trigger a panic where a race for switching from real or financial assets into cash crops up and brings the liquidity and solvency of banks in danger. If the public questions the solvency of the banks the risk of a run increases considerably and the Fed enters the stage by offering LOLR assistance. However, if the Fed decides not to supply liquidity to the banks in need, the payment system might brake down and the institutions that are debt financed will not be able to rollover on their debt. This could in turn have devastating effects on the economy and in the worst case scenario lead to a depression.

The Financial Instability Hypothesis by Minsky is mainly based on theoretical arguments and the point of departure is based on the fact that many corporations are debt financed in a capitalistic economy. He accentuates three types of financing that corporations can undertake: hedge finance, speculative finance and ponzi finance. The mix of these three debt structures in an economy combined with the level of liquidity determine the fragility of a financial system (Minsky, 1977, p. 142).

Corporations in hedge finance are characterized by having future gross cash flows over each significant period that exceeds any future obligation. In this case changes in the interest rate do not have any effect on the present values of cash flows. If however a decrease in cash flows or a default on debt from borrowers occurs, the risk of a corporation being transformed from a hedge finance unit to a speculative financing unit increases.

A speculative financed corporation is compelled to eat into its capital and take on or renew its debt in order to meet its obligations. Movements in the interest rate can therefore have significant effect on the present value of cash flows as an increase in the interest rate could transform this measure from positive to negative. Furthermore, an increase in the interest rate can change a speculative financing corporation into a ponzi financed corporation because it then is not able to meet its future obligations. Minsky further emphasizes:

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“The greater the weight of speculative finance in the total financial structure, the greater the fragility of the financial structure.” (Minsky, 1977, p. 144)

Ponzi financed corporations cannot meet their future obligations unless they take on new loans, hence the level of debt increases. An increase in the interest rate might therefore result in a negative present value of cash flows for this type of financing corporation. This type of financing is characterized by being unsustainable.

During a boom there is a tendency to units inside a financial system engaging in speculative and ponzi finance. This is due to increasing interest rates and realized earnings falling under estimated levels all while the peak of the boom is being reached. When the peak is a reality the economy of the corporations becomes overstretched. In this case the system becomes vulnerable to small increases in the interest rate. A failure of one corporation could therefore trigger a crisis. However, Minsky points to the fact that the crisis is more likely to be generated if the overall financial structure is based on speculative and ponzi financing at the peak of the boom.

Many economists believe that financial crises are mainly caused by exogenous shocks to the economic system. Minsky however mainly concentrates on endogenous factors as the fundamental causes of financial crises.

The Minsky-Kindleberger theory has been criticized as being too general and historic. This is however hardly the case as the theory includes factors that can be empirically examined.

2.1.2 Monetary Theory

Milton Friedman is a key contributor to monetarism. Together with Anna Swartz he wrote the influential book *“Monetary History of the United States 1867-1960”* in which he argues that excess money supply is inflationary and that central banks should solely focus on maintaining price stability. According to monetary theory the economy would be in equilibrium if not economic policy making brought with it disturbances to the economy. This assumption is based on the fact that monetary theory rejects that the capitalistic economy has a trend for disequilibrium or financial crises. Wrong policy making by a central bank can therefore have devastating effects on the overall economy and subsequently lead to a run on banks and a crisis. To resolve this problem, Friedman emphasizes the importance of implementing regulation on a central banks adjustment of the money supply (Friedman, 1962, p. 54).

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Anna Swartz (1986) makes a distinction between a real financial crisis and a pseudo financial crisis. She is of the opinion that there has not occurred a real financial crisis in the US since the Crack of 1929 but rather characterizes preceding crises as pseudo financial crises. Thus she defines a pseudo crisis as:

“ ... a decline in asset prices of equity stocks, real estate, commodities; depreciation of the exchange value of a national currency; financial distress of a large non-financial firm, a large municipality, a financial industry, or sovereign debtors – are pseudo-financial crises.” (Swartz, 1986, p. 12)

A real financial crisis occurs only when there are no financial authorities to deal with events, when authorities lack the necessary expertise and when the measures implemented are not trustworthy to the public in general. So long as the deposits of the private sector are protected there will be no breeding ground for a financial crisis. On the other hand a long period of deflation followed by the collapse of insolvent banks is characterized as a pseudo financial crisis. She continues to contradict the view of business cycle scholars and more directly the Kindleberger model by saying:

“It is not financial distress that triggers a crisis. The failure of authorities or institutions to respond in a predictable way to ward off a crisis and the private sector’s uncertainty about the response are the triggers of a real financial crisis. (...) Kindleberger’s assertion that, according to a monetarist view, ‘mania and panic would both be avoided if only the supply of money were stabilized at some fixed quantity, or at a regular growing level’ (pp. 5-6) does not accord with my monetarist view. Bubbles, like bankruptcies, would occur even if the money stock were free of destabilizing cyclical swings. (...) I conclude that manias, panics, and crashes reduce wealth. They are not per se financial crises unless the shift from tangible or financial assets to money leads to a run on banks.” (Swartz, 1986, pp. 12-24)

Friedman and Swartz (1963) accentuate that a LOLR is essential in preventing a financial crisis from occurring. Their point of departure is the Crash of 1929 and the subsequent depression. They point to the fact that if the Fed had intervened with LOLR support during the 1920’s the depression

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might never have occurred. However, their examination on why a run on the banks occurred is considered to be vague (Per H. Hansen, 1996, p. 24).

2.1.3 Sub Conclusion

There are clear differences in how the two schools of thought define financial crises. Monetarists are of the opinion that a financial crisis is real only when there is a run on banks whilst the business cycle theory is characterized by not giving a clear cut definition of a financial crisis. Instead business cycle theorists devote their attention to the factors leading up to a crisis hence deviating from monetarists by being more detailed in this regard.

The essential opinion of the business cycle school is that financial crises are endogenous elements in the economy which are closely related to the upper turning point of cyclical movements. Moreover, disintermediation is the result of financial crises which reduces the investments in the market and thereby affects the real economy negatively.

Monetarists on the other hand focus on the monetary policy as a determinant to the occurrence of financial crises. The effects on the real economy occur because a decreasing money supply affects prices negatively.

According to monetarists the breakdown of insolvent banks is a natural occurrence in the economy. However, if solvent banks are jeopardized due to a financial crisis the central bank will have to intervene with LOLR assistance in order to prevent the crisis.

Both schools are generally characterized by operating on a macro level and therefore can be criticized for not including relevant microeconomic factors in their analysis of financial crises. Furthermore, it is difficult to say which theory is the better in explaining financial crises as they both have different strengths and weaknesses.

2.2 Theory on the Micro Level

The examination of financial crises has so far treated factors on a macro level thus neglecting important variables on the micro level. Hamilton & Mickletwaith (2006) and Linda Lai (1993) have treated the issue of financial crisis on an institutional level whilst Werner De Bondt (2003) focuses on the psychological behavior of market participants during financial bubbles. These view points are reviewed in the following chapters.

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2.2.1 Primary Reasons of Corporate Failure

In an effort to gain an understanding of the internal reasons behind corporate failure Hamilton & Micklethwait (2006) list 6 primary reasons.

Poor strategic decision making when entering new product segments and markets forms one of the reasons. The failure in understanding the business drivers can lead to bad decision making.

Overexpansion can occur when organic growth is no longer enough for a company and it goes down the path of acquisitions. The goal would usually be to achieve synergy effects but Hamilton & Micklethwait emphasize the integration costs and lack of management and cultural differences as destructive forces in this connection. Furthermore acquisitions are too often done at too high a price. It is however when acquisitions are done in an effort to achieve short term growth that it becomes most risky. As the company grows, so must the targets in order to achieve the same level of growth.

Dominant CEO's become an issue when the board becomes tacit and stops scrutinizing the actions of the CEO thus relying fully on his judgment and leaving him too much power.

Greed, hubris and a desire for power is another reason behind corporate failures. The incentive schemes and desire for power in modern corporations spur on actions among executives that can become quite dubious and sometimes even catastrophic.

An area that also has contributed to corporate failures in the past is the internal control systems of companies. Complex or unclear organizational structures are often the root of failure in the internal controls. This results in gaps in information flows and bad decision making as a result thereof. The internal audit system is also of importance in regard to this topic as this function usually is not prioritized and therefore understaffed in many cases. This leaves many gaps in the company control system which may entice fraud.

Ineffective boards are mentioned as the sixth and last primary reason behind corporate failure. The integrity of the board must be maintained so as to ensure the pursuit of the interests of shareholders. Not so independent board members may pursue their own interests thus creating an agency problem which in any case will be harmful to shareholders.

Any one of the 6 primary reasons for corporate failures stated above might individually lead to the collapse of a corporation but it is however important to note that the presence of one does not exclude the others. They are independent and mutually reinforcing.

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2.2.2 Organizational and Managerial Misinterpretation

In the examination of the Norwegian banking crisis between 1988 and 1993, Linda Lai (1993) stressed that there was too little focus on organizational and managerial influences thus the research at that time was mainly concentrated on environmental causes. A research into this micro perspective is highly important because it can assist in minimizing the occurrence of future financial crises. She wrote:

“From a management research perspective, it is of outmost importance to inquire into the impact and nature of managerial contributions to the crisis, in order to avoid or reduce the magnitude of similar crises in the future.” (Linda Lai, 1993, p. 397)

Managers tend to contribute to a crisis via misinterpretation thus choosing inappropriate or no action. Misinterpretation can be caused by common biases, traps in human judgment and decision making, organizational deficiencies and defects and resistance to accept responsibility (Linda Lai, 1993).

Linda Lai (1993, p. 398) further accentuates the following types of misinterpretations that may have a serious effect on a manager’s ability to handle a crisis:

- I. Blaming the environment (external attribution of failure)
- II. Focusing on self-confirming information (the confirmation trap)
- III. Over estimating own competence (over-optimism and over-confidence)
- IV. Believing that the situation is under control (illusion of control)
- V. Throwing good money after bad (irrational escalation of commitment)
- VI. Resistance to strategic reorientation (insufficient adjustment)

She points out that this list by no means is exhaustive but contains some of the most important factors behind the managerial effect on crises. Moreover, there is a close interrelation between the several factors, which are of outmost importance to the understanding of a crisis.

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2.2.3 Bubble Psychology

In *Bubble Psychology* (2003) Werner De Bondt characterizes the psychology and behavior of individuals during a bubble. The work takes into account four fields on the behavior of market participants; modern finance, behavioral finance, financial behavior and market behavior and asset price bubbles.

Initially, De Bondt accentuates that asset price bubbles are dangerous because they misallocate scarce resources and because they may lead to economic stagflation. Furthermore, contagion and spillover effects are likely to cause further damage to the economy.

The quality of judgment plays a vital role in regards to the valuation of assets. If developments positively exceed the expectations of investors, then one should expect that asset prices will increase and vice versa. Moreover, De Bondt emphasizes that it is difficult to identify a financial boom ex ante. Only with the benefit of hindsight are market participants able to do so.

“... price and value are not always one-and-the same thing.” (De Bondt, 2003, p. 206)

The investment decisions of individuals in the market are driven partly by reasons and partly by emotions. The psychology of participants, market imperfections and the limits of rational arbitrage have great impact during financial bubbles. Thus, individuals might have different preferences and valuation of different assets which in many instances will deviate from rational market prices.

De Bondt also refers to Keynes (1936) who describes the investment decision of market participants as being motivated by “animal spirits”. In times of prosperity, market participants tend to focus on the short term perspective and thus push prices rapidly upwards within a short period of time. However, these values tend to reach unsustainable levels and deviate strongly from long term fundamental values, which is why bubbles eventually burst. Those who ignore these facts during a boom or bubble and choose to focus on the long term fundamentals, usually lose to the market.

2.2.3.1 Modern Finance

According to De Bondt (2003) the rational paradigm of modern finance fails into two major perspectives. First, it fails to predict market behavior optimally and fails in regards to explaining the valuation of assets prices. Second, it is falsely based on the underlying assumption of perfect

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rationality, i.e. people are Olympians and not humans. Thus, modern finance is hardly useable in explaining the financial behavior of individuals and asset pricing theories because it lacks the inclusion of psychological aspects.

2.2.3.2 Behavioral Finance

As opposed to modern finance, behavioral finance includes psychology in the study of financial decision-making (De Bondt, 2003, p. 2007). It follows an empirical and inductive approach, is based on the fundamentals of bounded rationality and focuses on observed behavior. In order to understand why people behave as they do it is essential to analyze how they think. In contrast to the “rational economic man” people are “human” in real life.

De Bondt focuses his discussion on cognitive issues, hereunder mostly focusing on the psychology of judgment. He points out two elements that assist us in understanding how people think; mental frames and heuristics.

2.2.3.2.1 Mental Frames

A frame refers to a decision-maker’s conceptual model – that is how he understands and views a complex problem in the real world. Mental frames are constituted by social interpretations and stereotypes. Mental frames have great influence on our decision making because we are social animals, i.e. influenced by what others say and do. However, many frames are falsely constituted and are resistant to change.

2.2.3.2.2 Heuristics

In his effort to explain judgmental heuristics, De Bondt refers to, among others, the tandem couple Amos Tversky and Daniel Kahneman, who are characterized as being among the most prominent theorists within this field. Heuristics, or rules of thumb, are shortcuts for handling any given new information. Occasionally they may lead to systematic and predictable errors in the decision making of individuals. Three types of judgmental heuristics are observed: representativeness, availability and anchoring and adjustment.

Representativeness heuristic is relied on when people evaluate the probability of the degree to which an event is representative of another event. Prior probabilities, or base rates, have no effect

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on representativeness heuristics but should affect probability, thus individuals cannot be viewed as Bayesian decision makers. Moreover, representative heuristics fails to understand the statistical element of regression toward the mean. This has contributed to the research on overestimation of assets amongst participants in the financial markets.

The availability heuristic is used for estimating the probability of an event, the frequency of simultaneously occurring events or the numerosity of a class via the ease with which an event is brought to mind.

The anchoring and adjustment heuristic sets out to explain how first impressions affect the decision making of individuals. They make an estimate by starting from an initial value and make adjustments to yield a final conclusion. However, adjustments are typically insufficient because:

“(...) different starting points yield different estimates, which are biased toward the initial values.”

Tversky and Kahneman, Judgment under Uncertainty: Heuristics and Biases, 1974, p. 1128

This is referred to as anchoring.

De Bondt further emphasizes that the human cognition is conservative, meaning that people have difficulty adapting and changing their beliefs to new evidence.

2.2.3.3 Financial Behavior

In this part De Bondt describes shortly the behavior of amateurs and sophisticated investor. Amateurs see price patterns where there are none to observe. They tend to overestimate the correlation between past and future price movements and show signs of overconfidence. This may provide profit opportunities for sophisticated investors. Moreover, investors in general tend to be averse to realize losses.

Studies on sophisticated investors, i.e. security analysts, show that their behavior is human. The data suggests:

1. Excessive optimism
2. Excessive use of popular models
3. Excessive confidence

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4. Excessive rationalization
5. Excessive agreement among analysts

2.2.3.4 Market Behavior and Asset Price Bubbles

De Bondt accentuates that research shows that the psychology of investors influence assets price movements and that sophisticated market participants may benefit from the bounded rationality of inexperienced participants. Moreover, price reversals are influenced by the extrapolation of past price movements.

De Bondt disagrees with aspects of modern finance as it snubs the psychological element and the bounded rationality of some market participants that allows arbitrage opportunities in regards to abnormal profit. However, an arbitrage opportunity does not exist unless asset prices move towards their fundamental values in the long run.

In explaining the behavior of individuals during asset price bubbles De Bondt leans on the theory of Kindleberger described earlier. De Bondt further emphasizes that inexperienced investors think they will be able to exit the race without incurring losses.

2.3 *The Lender of Last Resort*

Financial crises have been a regular occurrence for hundreds of years. Given the negative effects on the real economy there is a need for a LOLR. Systemic risk is a big factor in this matter. Since investors have asymmetric information as to the financial status of their respective banks any signs of weakness can effectively spur on a bank run leading to a contagion effect.

The call for a LOLR stems from two essential factors which are taken for given in most domestic financial systems. The first is fractional reserve banking in which banks are only required to keep a fraction of their deposits in reserve while maintaining the obligation to redeem all obligations upon demand. Second is the monopoly of the government in the issuance of legal tender. This arrangement of the banking system renders it quite dependent upon the central bank in times when the demand for money increases, as would be the case in a financial crisis when money is scarce (Thomas M. Humphrey & Robert E. Keleher, 1984).

The term lender of last resort originates from Sir Francis Baring (1797) who used the definition ‘dernier resort’ in his work “*Observations on the Establishment of the Bank of England*”. Henry

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Thornton (1802) is however credited as being the first to fully articulate the role of the LOLR (Thomas M. Humphrey & Robert E. Keleher, 1984). Following in his footsteps Walter Bagehot published his work "*Lombard Street*" in 1873. Laying the ground work for future studies into the role of the LOLR they put forth their definition for the overall role of the LOLR. Protecting the money stock, supporting the whole financial system rather than individual financial institutions, behaving consistently with the longer-run objective of stable money growth and to preannounce its policy in advance of a crisis so as to avoid uncertainty are the essential roles in this regard. In addition Bagehot formulated his famous principle to lend freely at a high rate for good collateral (Xavier Freixa et al., 1999).

The question on how the LOLR should assist in times of need is a whole other subject in itself, one which is driven by controversy. Thornton (1802) was the first to identify the dimensions within which the central bank should assist (Thomas M. Humphrey & Robert E. Keleher, 1984). The macro dimension of a LOLR consists of market wide functions such as manipulating the interest rate in order to fight the adverse effects on a crisis on the overall market. This ensures easy access to liquidity to all market participants. The micro dimension on the other hand involves more direct assistance to individual banks in distress. It is obviously the macro dimension that must be said to be the one most in line with the mission statement of the central bank as the liquidity of the overall market must be protected (Thomas M. Humphrey & Robert E. Keleher, 1984). The latter of the dimensions was also supported by Walter Bagehot (1873) which is evident by the Bagehotian principles stated above.

The role of the central bank as a LOLR for individual banks is a hotly debated subject. Supporters of the monetary view argue for the role of the LOLR to be solely confined to operations via the open market. Thus individual banks should not be saved. Limiting assistance only to the open market ensures the distribution of capital to solvent banks. Off course it goes without saying that insolvent banks will be shut out from the interbank lending market leading to the likely demise of these (Goodhart & Illing, 2002, Bordo, 1990).

The exact opposite view is brought forth by proponents of the banking view. Charles Goodhart (1985) directly opposes this view and advocates the need for the LOLR to operate on a micro level as well as macro. Going a step further he reaches the conclusion that both solvent and insolvent banks should receive the necessary assistance. The reasoning behind this idea rests on the argument that banks that are illiquid will already be under suspicion for insolvency. As it is hard to evaluate

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the values of assets in times of crisis this leads to the decision of assistance to be made on a fragile foundation. The main rationale though is that the failure of a large bank reduces confidence in the overall system which again leads to contagion (Goodhart & Illing 2002, Bordo 1990). This theory supports the notion that today some banks might be considered to have become too large to fail.

A last approach to the idea of a LOLR is the free banking view. Minsky himself was highly sympathetic to the idea of a financial system without any central bank or public sector involvement believing that these conditions would lead to individuals behaving prudently. However, he himself admitted that there would be an expectation for a LOLR which thus has to be met (Charles Goodhart & Gerhard Illing 2002, p. 5).

Bordo (1990) mentions the argument that the only reason for banking panics is legal restrictions on the banking system. Without these the free market would produce a panic free banking system.

As time has shown the role of a LOLR can be played by several actors. In the past both the central bank and private banks have been known to be involved in the process. As both parties have an interest in the well being of the financial system this is no surprise. There is however historical evidence that private arrangements are inefficient to cope with panics as there are severe problems with coordination (Charles Goodhart & Gerhard Illing, 2002, p. 2).

2.3.1 Moral Hazard

An issue which is at the heart of the theory on the LOLR is the costs associated with central bank assistance. The extension of assistance to individual banks is recognized to be a factor leading to moral hazard among these institutions. Bagehot himself recognized this important factor in his literature:

“If extended too leniently, LOLR may lead to banks expecting liquidity support from the central bank... as a matter of course” (Bagehot 1873)

“Any aid to a present bad bank is the surest mode of preventing the establishment of a future good bank” (Bagehot 1873)

The issue of moral hazard was thus the prime reason behind his rule of extending credit at a penalty rate hoping that this would discourage all but the neediest from seeking assistance. Both Thornton

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and Bagehot were sure of the risks involved in assisting insolvent banks. Creating a safety net encourages future excessive risk taking (Bordo 1990).

Freixa & Rochet (1997) pinpoint two effects of central bank assistance on bank behavior. First there is an increase in risk taking. Second there is lower degree of monitoring by bank customers as they perceive their investments to be implicitly insured. They suggest the idea of constructive ambiguity as the means for reducing the moral hazard issue in relation to LOLR actions. Leaving doubt as to the question of whether assistance will be offered creates uncertainty among institutions and thus reduces excessive risk taking.

2.3.2 Sub Conclusion

As is apparent from the view points we have just examined, opinions on the LOLR differ to a high degree. Free banking advises a policy of no LOLR and no restrictions on the market thereby allowing the market to regulate it self.

The sole use of open market operations are recommended as a way to pump much needed liquidity into the market instead of assisting individual banks as this would only procrastinate the closing of insolvent banks.

Where the two methods above listed recommend a more or less indirect approach to the role of the LOLR the classical view argues for a helping hand to be extended directly to the banks in need. Henry Thornton and Walter Bagehot were to a great extend united on the view that banks should be helped. The purpose here being to allay the impending crisis and restore public confidence in the security of their bank deposits. Moreover Bagehot saw the penalty rate as a method to reduce the moral hazard issue related to LOLR actions.

Charles Goodhart however reject the distinction between solvent and insolvent banks claiming that valuation of assets is a far too complex a matter in light of the limited window of time available to a LOLR. Therefore this should not be a factor in the decision making process. The LOLR should aid all illiquid banks whether they are solvent or not if their demise would be damaging to the financial system.

It is undeniable that the different viewpoints on the matter of a LOLR differ from each other in various ways. Though they advice different approaches in an endeavor to aid the financial system and society as a whole it is paradoxical that it bears with it an inherent risk. Safety nets may contribute to the banks choosing a more volatile portfolio when chasing higher profits in the secure

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notion that rescue is guaranteed. As banks over the years have grown very big and near indispensable for society this may be an increasingly important topic for debate. The authorities have a tough decision to make in this matter and judging by the sheer number of approaches presented here there lacks a consensus in the area. Decisions have to be made on the basis of each distinct situation.

2.1 Literature on the Crisis

2.1.1 Financial Innovation

After the burst of the dot-com bubble in 2000 and the subsequent recession, a period of stability followed. This economic stability encouraged financial innovations that caused excess liquidity and the availability of credit increased as a result of heavy competition urging financial institutions to increase leverage ratios (L. Randall Wray, 2007, pp. 23-24). However, financial innovations are believed to have stemmed from laxer regulation on the business of financial institutions over the past couple of decades thus becoming the fundamental cause to the SCC (Wray, 2007, p. 2 and Michael Mah-Hui Lim, 2008, p. 7). Specifically it was financial innovations in the subprime mortgage market that provided the shock that started the wider shift in credit spreads and credit availability and subsequently lead to the SCC (Martin S. Feldstein, 2007, pp. 3 – 5 and Atif Mian and Amir Sufi, 2008, p. 33).

However, according to the writers belonging to the monetary school financial innovation is overplayed in regards to the triggering of the SCC thus there resides a disagreement on this fact (Goodhart, 2007; Bordo, 2007 and Michael Crouhy and Stuart M. Turnbull, 2008).

The euphoric environment encouraged financial institutions to follow lax lending criterion and to lend to high risk borrowers (Wray, 2007; Lim, 2008 and Felstein 2007). These high risk borrowers were characterized by having low or uncertain incomes, high debt to income ratios and poor credit histories (Feldstein, 2007, p. 4). Wray (2007) refers to “Ninja loans” (no income, no job and no assets) as a clear cut picture of how big a risk the lenders were running. Crouhy and Turnbull (2008) are of the opinion that these lending practices are illegal and therefore ought to be characterized as fraudulent behavior.

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2.1.1.1 Special Investment Vehicles

In order for banks to move the assets in question off their balance sheets they established the so-called structured investment vehicles (SIV's). These served as conduits, were non-bank subsidiaries and were the institutions that would hold the securitized risky assets (Wray, 2007). The originating banks would however serve as LOLR to the SIV's if these became illiquid or insolvent (Goodhart, 2007, p. 337).

2.1.1.2 Securitization and the “Originate and Distribute” Strategy

Subprime mortgages offer higher yield than standard mortgages. With market conditions appearing to be fine and real estate prices surging, this created a high demand for the securitization of subprime mortgage loans. This in turn led to the creation of mortgage backed securities (MBS) and collateralized debt obligations (CDO's) that subsequently landed in the hands of the SIV's for trading (Feldstein, 2007, pp. 3 – 4).

It came into play through the “Originate and Distribute” strategy that was implemented by American banks (Wray, 2007; Lim, 2008 and Feldstein, 2007). Goodhart (2007) gives the following short explanation of the strategy:

“So they originate the loans, securitize them, and then distribute them to various non-bank financial institutions... All this led to a disintermediation of assets off banks' balance sheets”

2.1.2 The Incentives of Bankers

The incentive compensation package for bankers is based on the volume of loans issued to borrowers and with no negative consequences in case of defaults. Lim (2008) blames the Economic Value Added (EVA) school of thought for trying to rationalize this behavior. According to EVA bankers will follow the overall objective of maximizing shareholder value at the expense of other stakeholders and the public. Lim further explains how EVA rationalizes the behavior of bankers:

“EVA is the criterion used to measure the performance of every institution, every department, and every individual... and the ones with the highest EVA are rewarded. Hence, within the banking system itself, one finds that traditional lending is out of favor as it consumes too much capital and

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results in lower EVA, whilst activities such as trading in securities and derivatives that use less capital and produce higher EVA are promoted. It then becomes rational for every individual pursuing his or her own interest to push the edge of the envelope, maximize her returns, and worry about the consequences later. A banker who brings in loans of the highest value is rewarded the same year, but if and when the loans turn bad a few years later, she/he has already moved on. This incentive structure invites the banker to take on extra risks, reap the rewards, and move on.” (Lim, 2008, pp. 16-17)

This philosophy also had its effect as originators were not merely focusing on producing volume but to a great extent sold the subprime loans to the financial market at a profit without concern as to the borrowers' ability to pay off their debt (Feldstein, 2007, pp. 4 – 6). However, it is emphasized that even though the borrowers were not creditworthy they nevertheless took on these loans with initial low teaser rates because they sought to get a piece of the action. Once the initial period with low teaser rates ended, the charged rate reset to a significantly higher level above the one charged to prime borrowers, resulting in the subprime borrowers having difficulty meeting their mortgage payments and subsequently being forced to default on their loans (Lim, 2008; Wray, 2007; Feldstein, 2007 and Christopher L. Foote, Kristopher Gerardi, Lorenz Goette and Paul S. Willen, 2008). Christopher L. Foote, Kristopher Gerardi, Lorenz Goette and Paul S. Willen furthermore emphasize that subprime borrowers may not have been fully informed of the risk related to the adjustable rate mortgages (ARM's). However, there is a lack of substantial research on this topic.

2.1.3 The Role of the Credit Rating Agencies

Credit rating agencies are likewise characterized as being in the heart of the SCC as many investors relied on their ratings for MBS, CDO's and asset backed commercial paper in general issued by the SIV's. Simultaneously, credit products had become complex which made it less transparent for investors to assess the underlying credit quality. In turn, end investors were compelled to rely on the risk assessments of credit rating agencies (Crouhy and Turnbull, 2008, pp. 9 – 13).

In relations to the role of the credit rating agencies the question of conflicts of interest resides (Goodhart, 2007, pp. 337 – 339 and Crouhy and Turnbull, 2008, pp. 9 – 13). On the one hand credit rating agencies are paid by originators and on the other they are offering services to originators. It points towards culpable behavior with credit rating agencies granting excessively generous ratings

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to the originators. According to Wray (2007) the credit rating agencies were accomplices because their ratings of the securities were essential to generating markets for risky assets. He refers to investigations carried out by Fitch that concluded:

“In most cases the fraud could have been identified with adequate underwriting, quality control and fraud prevention tools prior to the loan funding... broker loans have a higher occurrence of misrepresentation and fraud than direct or retail origination.”

However, Goodhart (2007) emphasizes that credit rating agencies depend so heavily on their reputation for honesty and fair dealing, that this culpable behavior is highly doubtful. Furthermore he points to the fact that there exists no reliable evidence on this behavior.

A critical issue of the SCC has been the uncertainty connected to the valuation of structured credit products (Crouhy and Turnbull, 2008, p. 17). Crouhy and Turnbull further accentuate that due to the high degree of uncertainty, prices for certain instruments were well below their “true” value. The true value of an instrument is what you would receive if sold. The increasing uncertainty resulted in the tightening of credit and finally the beginning of a credit crunch.

2.1.4 The Policy Making of the Federal Reserve

The Federal Reserve held interest rates at a very low level during the period of 2001 till 2005 as a response to the threats of the recession. This easy monetary policy brought with it a great injection of liquidity into the US market which ultimately triggered the increase in real estate prices and subsequently the SCC (Charles A. E. Goodhart, 2007, pp. 332 – 333; Crouhy and Turnbull, 2008, p. 5 and Bordo, 2007, p. 2).

In the years leading up to the SCC the policy interest rates were increased by the Fed in an attempt to prevent inflation from hitting the economy (Michael D. Bordo, 2007, p. 2). Bordo agrees with Goodhart, Crouhy and Turnbull and Feldstein that the easy monetary policy of the Fed between 2001 and 2005 played a vital role in the occurrence of the SCC but characterizes the following tight monetary policy as being the initiating factor (Bordo, 2007, p. 2). This is in opposition with the view of Wray (2007), Lim (2008) and Feldstein (2007) who do not accentuate the policy making of the Fed as the triggering factor behind the SCC.

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In a historical perspective the Fed has almost always supported the financial market from breaking down. This downside protection has thereby created a safety net for financial institutions and brought with it moral hazard complications. Financial institutions are hereby encouraged to take on greater risk. Goodhart (2007) refers to this phenomenon as the Greenspan Put and accentuates that this played a vital role in the mispricing of the risk on MBS and CDO's.

2.1.5 A New Era?

There was a belief in a new era of good times – a “this time it's different” attitude (Lim, 2008, p. 7). Lim leans on the postulate of Minsky (1986):

“Success breeds a disregard of the possibility of failure... As a previous financial crisis recedes in time, it is quite natural for central bankers, government officials, bankers, and even economists to believe a new era has arrived.”

The great success investors experienced by investing in real estate rubbed off on other investors which contributed to a build up of optimism and euphoric belief in the ever increasing prices of real estates. This led the market to ignore downside potential and investments in real estate seemed to provide a riskless profit for both lenders and borrowers (Wray, 2007, p. 17). Goodhart (2007) calls this phenomenon “The Great Moderation/Stability” where he refers to the mispricing of macro economic risk. The persistent macro economic stability had led many to believe that macro economic risk had been significantly reduced. In this regard Goodhart (2007) points to the general upturn since the 1990's. However, Wray (2007) points out that Minsky would not blame irrational exuberance or manias or bubbles as causes to this crisis. Instead, he would focus on the forecasted development of real estate prices, future income, actions of policy makers and the ability to hedge risk. In this regard Minsky would, as opposed to Goodhart et al., characterize the behavior of those caught up in the boom as being rational.

Bordo (2007) accentuates that housing prices tend to be pro-cyclical hence there exists a pattern between the tightening of monetary policy and reversals in real estate prices. During the period with easy monetary policy the low interest rates made it more accessible for individuals to finance a house through loans. This created a higher demand for real estates and pushed the prices upwards in

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the same period. When the Fed in 2005 began to increase the policy rate credit became less excessive and prices on real estates decreased.

2.1.6 Contagion

During the course of events the threat of a crisis hitting the overall US economy increased. All other things being equal, this brought with it an increase in systemic risk because trouble in the subprime market and asset backed commercial paper market began to affect other markets (Bordo, 2007, p. 5). Wray (2008) also accentuates that many banks became illiquid and some even insolvent due to their involvement in the mentioned instruments.

The contagion effects did not merely spread inside the US economy but went on to affect the global economy (Wray, 2007, pp. 34 – 40 and Reinhart and Rogoff, 2008, pp. 11 - 12).

However, contagion effects stemming from the subprime lending market have yet to be addressed thoroughly.

2.1.7 The Future of the Subprime Credit Crisis

Many of the writers give different propositions on how to cope with the continuation of the SCC (Wray, 2007; Lim, 2008; Feldstein, 2008; Crouhy and Turnbull, 2008; Bordo, 2007 and Goodhart, 2007). Nevertheless, one should take these propositions with a grain of salt as the SCC still is current and the full consequences have yet to reveal themselves.

2.1.8 Sub Conclusion

The SCC is not over yet, for which reason the cumulative consequences of this crisis cannot be determined at this point in time. One can only estimate what the end result will be. The limited literature on the SCC so far is influenced by this fact and is therefore to a great extent analyzing the factors behind the crisis, the consequences at the point of the writing of the work and giving estimation on the future effects on the economy. However, one could discuss whether or not these estimations are valid and realistic but this issue has little relevance in regards to the overall objective of this thesis.

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Even though Minsky is not alive today to observe and comment on the SCC a few of today's commentators have delved on the fact that his theory on financial crisis is workable. Bordo emphasizes that the business cycle is usable in explaining the SCC:

“The cycle is financed by credit. Lending booms and busts and the credit cycle are also intimately connected to the business cycle.” (Bordo, 2007, p. 2)

Minsky being one of the most prominent characters in the world of the Business Cycle School must therefore be the reference point. However, there lacks a thorough analysis on the course of events of the SCC based on the theory of economists belonging to the business cycle school in general. A few of the papers refer to some part of Minsky's postulates but a thorough analysis describing the different mechanisms of the entire crisis using his theory or related business cycle theory does not exist.

According to Wray, Lim and Feldstein financial innovation in the subprime mortgage lending market is considered to be the main cause to have triggered the SCC. On the other hand writers with a monetary perspective contradict this view and instead accentuate the wrong monetary policy of the Fed as the factor that eventually initiated the current crisis. In general it has to be pointed out that monetary writers tend not to focus on the factors leading up to the SCC to the same degree as the writers from the business cycle school. Furthermore, there is consensus among monetarists that the SCC is a real and not a pseudo financial crisis because of the initial threat and subsequent realization of spillover effects also hitting the financial market.

Contagion is a part of the SCC that lacks thorough research. The SCC has spilled over to other markets on a domestic and global scale and it is considered highly essential to analyze this development and the SCC's future effects on the domestic and global economy. Furthermore, the threat of a depression has not been granted much attention. In this regard it would be plausible to include Fisher's theory on Debt-Deflation.

The literature on the SCC so far is characterized by analyzing elements on a macro level. There generally lacks a delving on the course of event on the micro level as these mechanisms are of high importance to the understanding of the SCC. Lim is one of the few writers who dig deeper into a small part of the micro elements via his review of the bankers' incentives. However, there is the important issue of corporate and managerial failure and psychological aspects of the behavior of

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financial market participants in different segments of the crisis which have not been dealt with. The literature in this aspect is so far mainly focused on the role of the rating agencies.

Goodhart (2007) accentuates:

“It is difficult for a single person to put together a completely coherent story of everything that has happened, unless they have been working for one of the banks at the centre of the storm.”
(Goodhart, 2007, p. 332)

It is correctly observed by Goodhart that it is impossible to give a coherent analysis of the entire crisis. This said, by examining the written literature so far one will notice that there certainly exist some gaps in the literature that need further examination.

2.2 The Lender of Last Resort

Where we in past chapters have focused on the literature with regards to the SCC we will now take a closer look at the reactions of the Fed in combating the crisis and its effects on the financial system as a whole.

As stated in the literature the LOLR can conduct operations on the macro- as well as on the micro level. The review on this literature will therefore contain elements of both.

We find the literature on the subject to be somewhat limited. This is surely due to the aforementioned fact that the crisis is not yet over and the work of the Fed to contain the crisis is still in progress. This is especially the case for literature regarding the LOLR. As the crisis continues, measures are continually implemented to cope with the challenges that occur. We will however give as thorough review as is possible under current circumstances.

Most scholars are in agreement on the need of a LOLR in the event of a financial crisis (even though there are different opinions on what constitutes a real financial crisis). The subject that divides the waters is however the means by which the LOLR should assist a financial system in need.

Bordo (2007) analyzes the SCC in a paper and takes a look on the challenges facing the LOLR. He recognizes the distinction between pseudo- and real financial crises set forth by Anna Schwarz (1986) but points however to the contagion effects of the collapse of the subprime derivatives into the interbank loan market and the freezing up of liquidity as such imminent threats of a real

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financial crisis that actions by the LOLR are justifiable. However, the contagion effects alone lack substantial examination.

As for the actions that ought to be taken in order to stem up the crisis on a macro level, Bordo leans on and recommends the teaching of Thornton (1802) and Bagehot (1873). Reduction of interest rates and liquidity injection are the predominant tools in this regard. However, he delves on the question of how long the Fed can keep this sort of macro economical assistance without compromising the other objectives of this institution. As the overall goal of the Fed is to keep a leash on the inflation rate excessive emission of liquidity seems to undermine exactly that goal. Bordo recommends that the Fed keeps this in mind and assures market agents on its commitment to this mission thereby stemming up inflation when issuing additional liquidity into the market.

Goodhart (2007) emphasizes the rising risk premiums and shortage of credit as prime incentives to lower federal rates as well as the penalty rate. Another point of resemblance between Bordo (2007) and Goodhart lies in the peculiar situation a lowering of rates poses for the Fed. Price stability must be maintained therefore making lower rates an untenable situation. The effect that the macro economical assistance has in undermining the primary objectives of the Fed is an important point of study given the indirect effects on the real economy.

Another form of help could be provided by liquidity injections either by direct lending or open market operations. Lending would however necessitate a widening of the Fed's notion of good collateral as the freezing up of the markets result in less liquid assets for the banks. This means that it is hard to distinguish solvent banks from insolvent ones.

Moral hazard is here pointed out to be a crucial point, as the banks seem to have brought the situation upon themselves by not maintaining enough liquidity. A widening of collateral would certainly set a negative precedence for the future. Goodhart therefore poses the question of whether or not moral hazard should actually be an issue in a financial crisis. This is also the main issue in his view on the LOLR where he suggests that solvent and insolvent banks should receive assistance as it is hard to distinguish between them on account of the complexities connected with the valuation of assets as collateral. Also he argues that the collapse of a big bank could lead to a loss of confidence in the whole financial system which would further worsen matters.

Where previous authors recommend traditional monetary policy tools as the way forward in fighting the crisis Thomas Hoenig (2007), who is the president of the Federal Reserve Bank of Kansas City, points to the problems inherent in the transition from bank-based to capital-market

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financial intermediation as being the future challenges for the central banks in their aim to secure financial stability. Where the fundamental problems of the SCC have been seen before in traditional banking crises there is now a new layer to the current one. The new layer is based on the fact that the current problems arise in financial institutions outside any regulatory and supervisory control. These institutions are also not allowed direct access to the traditional safety net endowed upon the commercial banking community within the US. He emphasizes the complications related to this new layer and the challenge it poses for the financial authority i.e. the Fed.

Stephen G. Cecchetti (2008) has delivered a major contribution to the study on the role of the Fed with regards to the SCC. At the moment of writing this is the newest and most detailed study on the topic and as such it is the most encompassing article thus far.

The issue raised by Hoenig is indirectly taken up by Cecchetti who discusses the innovations in tools of monetary policy initialized by the Fed to take on the new developments in financial markets.

Cecchetti starts off by arguing for the need of central bank intervention pointing to the initial losses of banks and financial institutions from their exposure to the subprime market.

Early in the chain of events the situation called for injection of liquidity as committed lines of credit ate into the capital of banks. Here the central bank provided the necessary funds by trading treasury securities for cash. However as the months progressed it became apparent that more actions had to be taken. Cecchetti points out the freezing up of the interbank lending market as the prime culprit in the worsening and contagion of the dire situation. Two possibilities are stated for the freezing up. One explanation is a perceived increase in credit risk (default risk) which would place further drain on bank assets. A second possibility is the uncertainty as to the values of the assets of financial firms which encouraged a hoarding of cash in an effort to fulfill requirements on capital reserves.

In order to contain the chain of events conventional as well as unconventional measures were employed by the Fed. Where the cuts in discount lending rates and increases in the terms of loans represent orthodox measures Cecchetti mention a number of innovative new actions thought of and used as the crisis plays out. Some actions he argues can be viewed as having a fiscal touch rather than a monetary as it strongly resembles bank subsidization.

An example of this would surely be the collapse of Bear Sterns and subsequent assistance by the Fed in brokering J.P. Morgan Chase's purchase of the company. This led to the creation of the Primary Dealer Credit Facility (Cecchetti, 2008). The dealers were for the first time in many years

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allowed to borrow directly from the Fed. Cecchetti questions the justification of the bail out of Bear Sterns undertaken by the Fed stating that even though the bank seemed solvent it sets a negative precedence in accordance with the teaching of moral hazard. A rescue operation of an investment bank, even one that is too big to fail, undoubtedly sends out a wrong message to the investment community.

The uselessness of conventional measures in the paper by Cecchetti linked with the stigmas revolving around borrowing from the Fed. Out of a necessity to overcome this stigma and relieve the acute need for liquidity the Fed introduces the Term Auction Facility, Term Securities Lending Facility and The Primary Dealer Credit Facility.

The Term Auction Facility has the benefit that borrowers are anonymous. At the same time it is not only the 19 primary dealers that bid in the auction but all banks in need. Collateral is provided by assets of the respective borrowers. The Fed accepts assets that might otherwise have little value in a dried up market thereby giving banks some breathing room.

The Term Securities Lending Facility aimed at reducing hoarding of treasury securities and thereby releasing money into the financial market. AAA and Aaa rated MBS not on review for downgrading were accepted as collateral for Treasury securities thereby securing the liquidity of afore mentioned MBS.

The innovative responses by the Fed described above illustrate the dynamic rather than static environment in which it operates. In a changing environment the Fed too must evolve and adapt in order to fulfill its objectives.

2.2.1 Sub Conclusion

Throughout the review there is consensus that the central bank needs to step in as a LOLR as matters surely look dire. Papers published in the offset of the financial crisis had the luxury of recommending the conventional methods we all know. Lowering rates and injecting liquidity have shown to have had its deficiencies however. For various reasons market reactions did not fully meet the expectations of the Fed thus spurring innovative new measures. As the crisis evolved the Fed had to follow suit.

On a macroeconomic level it is thus a relevant issue to study the actions of the Fed and the responses to these so as to gain a deeper understanding of the complications related to the initial actions and the background and usability of these new tools. The Fed's commitment to maintain

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price stability is a factor that constitutes a dilemma in macroeconomic LOLR actions. As such it is also a highly relevant object of study.

The recent collapse of Bear Sterns shows that the work of the Fed continues on a micro level as well as macro. The investment banking industry however represents a controversial problem for the Fed. As these banks aren't under the watchful eye of the Fed and do not have access to direct assistance from the Fed either, they form a new challenge for the LOLR. It is thus an obvious area which calls for further analysis.

A big issue in LOLR actions which has been mentioned time and time again is the issue of moral hazard. The question for the Fed is when to stop its assistance. It is however a complicated question which is hard to answer.

3 Statement of Problem

The ongoing Subprime Credit Crisis continues to wreak havoc in the world's financial markets. Given the importance of the US markets for the world economy, this is an obvious topic for this thesis.

As our main motivation rests in gaining and facilitating an in depth understanding of the crisis we wish to analyze the current SCC by using the theories on financial crisis developed by Hyman P. Minsky and Charles P. Kindleberger. The literature on the SCC so far is characterized by lacking a thorough analysis of some essential contributing factors. Using the Minsky-Kindleberger model as a framework thus enables us to delve deeper into these factors and construct a more detailed analysis of the course of events. The threat of a depression following the SCC calls for an inclusion of Irving Fisher's Debt-Deflation theory in the analysis when necessary.

Given the lack of a deep examination of the SCC on a micro level in the literature so far we also wish to conduct an analysis of the behavior of subprime mortgage lenders and subprime borrowers.

As the current crisis has gone international we are compelled to define the US markets as the focal point of our analysis as the crisis originated from this economy.

The Fed has played an active role as the LOLR in an effort to minimize the damages of the SCC. We will in an analysis on the LOLR aim to discuss the responses of the Fed using the relevant theories. As the theory on the lender of last resort states however, this role is not without its controversies. In the light of these controversies we will discuss essential motives for responses and the future implications of these.

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4 Delimitation

The SCC is an extensive event that is difficult to cover with the restrictions of this thesis. Many aspects of the crisis are certainly relevant and interesting for examination. However, due to the specificity of the problem statement it is important to mention the aspects that will not be dealt with. The SCC is characterized by having spilled over to other financial markets and economies in general. Although the contagion effects are a relevant issue this thesis will only examine the conditions within the US economy.

One could draw parallels to past financial crises in an effort of trying to obtain a greater understanding of the current crisis. However, in this thesis this will not be the case because of the theoretical method. References to earlier financial crises throughout the analysis might occur, but these will not be extensive parallels.

In relations to obtaining a greater understanding of the SCC the Minsky-Kindleberger model will form the foundation of this part of the analysis supported by Fisher's "*Debt Deflation*" theory; hence we deviate from including other relevant theories from the two schools of thought.

The theories of Hamilton and Micklethwait, Lai and De Bondt's "*Bubble Psychology*" have been selected to form the theoretical foundation of the analysis on the micro level. We thus deviate from including other relevant theories on a micro level besides referring to the theory of Tversky and Kahneman "*Judgment under Uncertainty: Heuristics and Biases*" as support to De Bondt. Moreover, as noted earlier, because of space limitations we have determined only to analyze the behavior of the participants at the core of the crisis; subprime mortgage lenders and subprime borrowers. However, it is important to emphasize that an analysis of other participants, including financial institutions, corporations, credit rating agencies etc., equally are of importance to the understanding of the SCC.

Financial innovation is characterized by having played a vital role in the occurrence of the SCC. In order to obtain an in depth understanding of this factor it is important to examine the technicality behind the involved assets. Due to limitations we will only refer to the work of others in this regard; hence not performing calculations of our own.

The analysis on the responses of the LOLR will off course be geographically confined to the US. Here we will examine only the responses of the Fed as the LOLR to the financial markets using relevant theory.

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Arguments expressed by the free banking view will not be playing a major role in this regard however, given the irrelevant nature of this proposition in our case.

The much discussed topic of an international LOLR will furthermore not be examined in this paper so as to confine the subject within the US market. The SCC is still ongoing and therefore the full ramifications of the crisis have not yet revealed themselves and the job of the LOLR is not yet finished. Therefore we are compelled to put a time limit on our studies on the subject. Subsequently we have chosen the time window from the outbreak of the SCC (i.e. August 2007) till September 30 of this year.

5 Disposition & Structure

A thorough treatment of our problem necessitates a logical method of approach. In the next chapter we shall describe the method that will be utilized. The implemented theories will be discussed along with the sources used for retrieval of empirical data.

Having done this we will move forward with our analysis. Here we shall use a divide and conquer strategy by splitting the analysis into three parts. Beginning with a macro-level analysis of the SCC we will use theories on financial crises in order to explain the overall reasons for the occurrence of the crisis.

Having done an analysis on a macro-level we will take a closer look at selected elements on a micro-level that coherently have contributed to the outbreak of the crisis.

After uncovering macro- and micro-level reasons for the build up and outbreak of the crisis our next step will involve a look into the ramifications of the SCC. More specifically we will look into the issue of the lender of last resort in the final part of the analysis. Here we will uncover the actions of the Fed as the lender of last resort in its efforts to contain and ameliorate the consequences of the crisis.

The approach utilized for the analysis will be a mix of a chronological and thematic approach thus achieving a compromise between these methods. The studies on macro-economical reason for the SCC will be a on a chronological basis as it is our impression that this method best serves our purpose. At the same time this method provides the reader with a logical view of events as they unfolded.

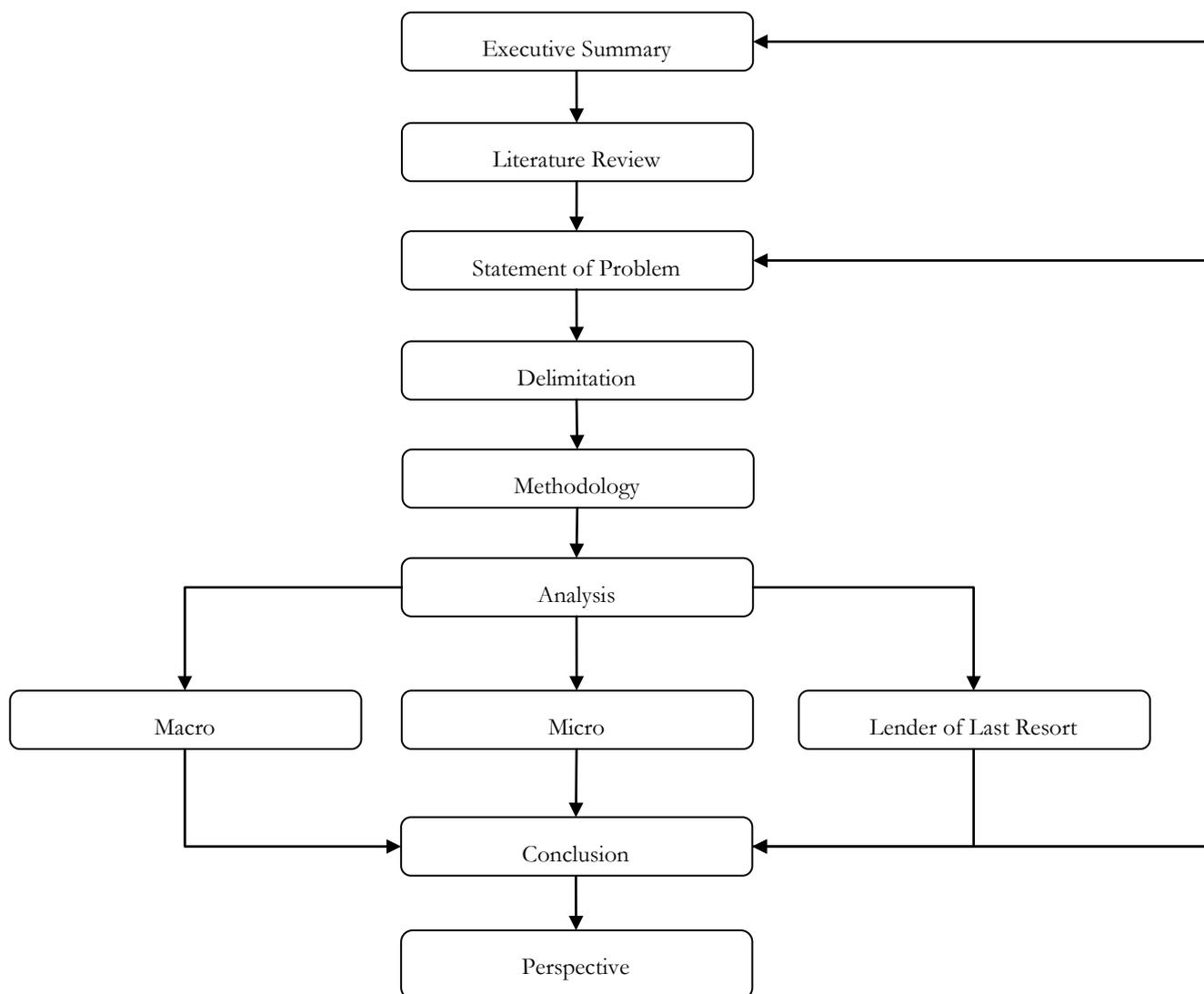
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The micro-level analysis however will be based on a thematic approach as we here will focus in on essential factors and no chronological structure is deemed to be necessary.

As for the lender of last resort we make use of a mixture of both approaches. Thematically the section is divided into the macro – and micro responses of the Fed. The respective chapters are chronological in structure.

The approach however is not without its disadvantages. Given the mixture of different approaches it is unavoidable that some issues may be mentioned more than once in different parts of the analysis. As much as this may be the case it is an unfortunate side effect of our deliberate choices. We believe however that our approach is the best given our statement of problem.

Figure 1: Structure



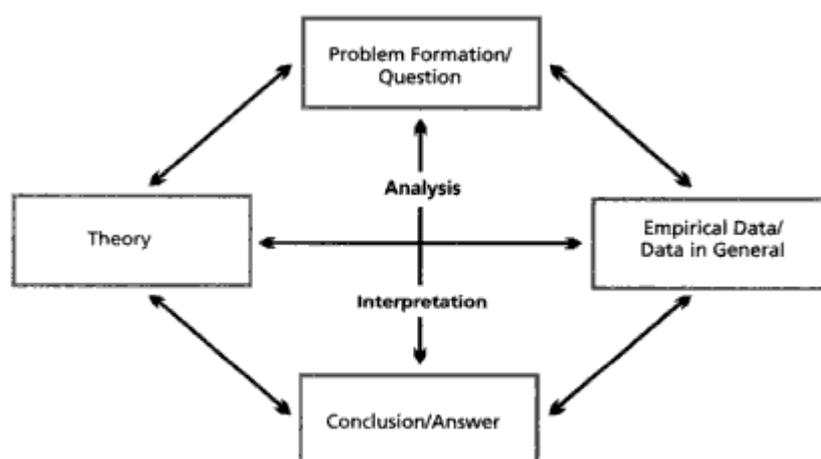
Source: Own making

6 Methodology

6.1 Research Design

The research design is used as a combined account of our planned research methods. Of course the design must be designed in such a way that it best enables us to answer our stated problems. Therefore the design must at all times uphold its logical connection with our statement of problem.

Figure 2: The Knowledge Production Processes



Source: Ib Andersen, p. 29

Even though this connection with the purpose of our thesis is of highest priority, other constraints imposed on us have inevitably contributed to the molding of the research design. Essential factors in this regard are the scarcity of time, i.e. our deadline is due probably way before the SCC is over and capital which constrains us from conducting research that requires excessive amounts of either or both of these resources.⁴

In this thesis we will conduct our analysis on the basis of deductive knowledge creation. This entails that we on the basis of general principles are able to draw conclusion on individual cases.⁵

Before we continue with an account of our method of choice we need an identification of objects that need study according to our statement of problem. The essential objects are in this case: The

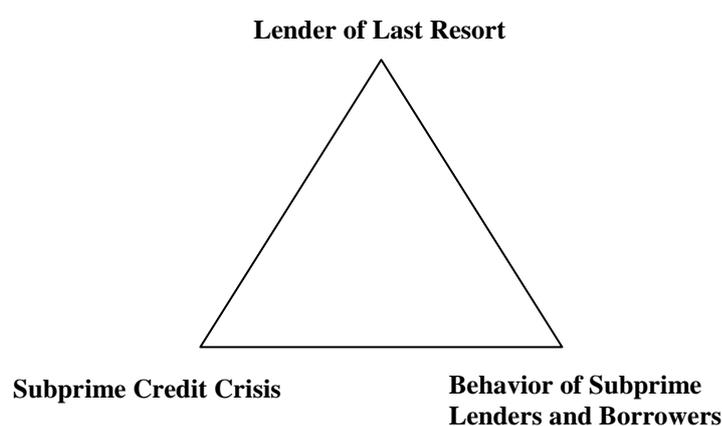
⁴ Den skinbarlige virkelighed, p. 139

⁵ Valg der skaber viden – om samfundsvidenskabelige metoder, pp. 101-113

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macroeconomic reasons for the SCC, behavioral mechanisms of borrowers and lenders and the LOLR.

Figure 3: Fields of Object



Source: Own Making

The fields of object affect the choice of data on which we will elaborate more in the coming section.

6.1.1 Data

Roughly speaking there are two sets of data categories: primary- and secondary-sources. Primary data is a common definition of the set of data which is produced by the scholar himself. Secondary data however, is produced by others and is readily available for use.⁶

Given the delimitation in this thesis we are compelled to resort to secondary data as the means for gathering information thus refraining from conducting any research studies of our own. The reasoning behind this decision is that the work would become redundant due to the myriad of data on the SCC in the US which is more than enough to work with. Thus we are able to devote more resources on actual treatment of data rather than retrieval.

A further distinguishing feature between data is the partition into quantitative and qualitative data.⁷

⁶ Den skinbarlige virkelighed, p. 195

⁷ Problemlorienteret projektarbejde, p. 152

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The choice between these two depends on the kind of problem that is at hand. We have utilized data of both types as we have deemed them both necessary for the working process.

The secondary data used throughout this thesis is retrieved via several sources. Working- and scientific papers and books are used for a more theoretical approach whilst articles and web pages are used to get more up to date and targeted information. This is especially important as the crisis is going on at this very moment and day to day updates therefore increase in importance.

Some of the works are physically at hand whilst the majority is obtained via the Internet. Important web pages in this regard are the big financial papers, news associations, web pages of federal institutions and statistical databases.

However, we wish to emphasize the necessity of obtaining credible information through these information channels. The scientific nature of this paper will be protected by the sole use of published works from the hands of credible authors and news sources.

6.1.1.1 Critique on Data

Literature on financial crisis is often characterized by being highly influenced by the school of thought of the author. Monetarists present their view on the SCC and indirectly, and some times even directly, criticize the viewpoint of the Business Cycle School and vice versa. The same applies for literature on LOLR. It is therefore important to have a critical stance on the retrieved data and literature. This we have accomplished in two ways. Where possible we have sought out our own data in data bases so as not to be influenced by the interpretations of others. Secondly we have examined the sources used in our literature thereby bypassing the potentially subjective opinions of authors.

Due to the actuality of the SCC, journalists, other writers and yours truly do not have the benefit of hindsight in regards to capturing all aspects of different fields within the SCC. Thus it is important to have a critical eye on published works and articles in this regard.

6.1.1.2 Reliability and Validity

The quality of our data is determined by the extent of reliability and validity. Reliability is a measure of the uncertainties connected to our data and thus the extent to which our findings are

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accurate. Validity measures the level of interconnectedness of the chosen theory and empirical data and the relevancy of the empirical data to the research questions in our problem statement.⁸

We believe this thesis to have a high degree of reliability due to the tough criteria our sources have been subjected to. Firstly we have assured that all our data have been put forth by credible sources with good reputations. Secondly, we have taken safe guards against cases where the author might be leaning so much towards an ideology or school of thought that objectivity is compromised. Taking a critical stance on every bit of information has thus played a vital role in the securing of a high level of reliability.

The thesis is characterized by containing a high level of validity. Many working and scientific papers and articles included in our analysis refer to relevant viewpoints from the chosen theories. Moreover, data that describes events from the SCC can easily be described using the chosen theories. Simultaneously, the retrieved data is highly relevant in answering our main research questions.

6.2 Theory

This section has its purpose of providing the reader with an overview of the methodology of the thesis. We begin by substantiating the choice of theory, its use in the analysis and critique hereof.

6.2.1 Choice of Theory

Minsky is by many considered to be one of the main contributors to the understanding of financial crisis. Many economists today use his theory as their foundation in explaining the SCC (Wray, 2007; Lim, 2008; Feldstein, 2007). Some have even characterized the current financial crisis as “A Minsky Moment”.⁹ Kindleberger lays his foundation on the theory of Minsky. Due to the close

⁸ Problemorienteret projektarbejde, p. 141

⁹ Whalen, Charles, “Understanding the Credit Crunch as a Minsky Moment”, M. E. Sharpe Inc., Challenge, vol. 51, no. 1, January/February 2008, pp. 91–109; Malmgren, Harald B., “The Credit Crisis Is Not Over”, Vol. 21, Issue 4, Fall 2007, p. 58-61; Cassidy, John, “The Minsky Moment”, The New Yorker, February 4, 2008; Chancellor, Edward, “Ponzi”, Institutional Investors, Vol. 41, Issue 2, 2007, p. 56-64; Lahart, Justin, “In Time of Tumult, Obscure Economist Gains Currency – Mr. Minsky Long Argued Markets Were Crisis Prone, His ‘Moment’ Has Arrived”, The Wall Street Journal, August 18, 2007

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relation of the two theories many refer to these as the Minsky-Kindleberger theory.

The Minsky-Kindleberger theory will form the foundation of our analysis because we consider this theory to be highly useful in analyzing the SCC. Furthermore, as opposed to monetary theory the Minsky-Kindleberger model to a larger extent takes the factors leading up to the crisis in regard.

The Minsky-Kindleberger model will be supported by the Debt-Deflation theory of Irving Fisher (1933). It is important to include Fisher's theory because, compared to the Minsky-Kindleberger model, it is more detailed in its explanation of the mechanisms leading up to a crisis. Furthermore, Fisher has important points that are of relevance to the current financial crisis. The inclusion of the Debt-Deflation theory will thus add to the broader understanding of the SCC.

On the micro level we have chosen to select the theories of Hamilton and Micklethwait (2006) and Lai (1993) because of their relevance to explain the behavior and failure of subprime mortgage lenders whilst the theory on "Bubble Psychology" by De Bondt (2003) is included because it is highly useful in analyzing the behavior of both participants. De Bondt is relevant because of his inclusion of several aspects of individual behavior, such as the theory of Tversky and Kahneman "Judgment under Uncertainty: Heuristics and Biases" (1974). By including these theories on the micro level we add a new dimension to the understanding of the SCC.

We established earlier that the subject of LOLR is one characterized by controversies. Several viewpoints are represented in the text by Bordo (1990). This text will form the basis of our analysis on the issue of the Fed as LOLR.

As the theories on the subject is not a framework for an analysis but more of a set of ideas, representing the four schools on this topic, it is not a straight forward action to pinpoint a specific viewpoint that will be utilized throughout the paper. Instead we shall draw on knowledge from all four which in unison shall lead to a discussion of important main themes as to the SCC and the Fed as the lender of last resort.

The only view-point we find to be rather unnecessary for the purposes of this thesis is the school of free banking. This is due to the irrelevant and improbable nature of the idea in relation to the SCC as the mere existence of a central banks and regulation in the US market makes any discussion based on this viewpoint superfluous.

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6.2.2 Use of Theory

The Minsky-Kindleberger model contains six points; displacement, euphoria, financial distress, panic, contagion and the lender of last resort. These points are, according to Kindleberger, crucial factors that play a vital role in relations to the occurrence of a financial crisis. The main part of the analysis of this thesis will be divided into six sections thus using the Minsky-Kindleberger model as a framework. This chronological approach allows us to analyze the SCC thoroughly – on a macro level – and carry the reader through the different crucial phases of the crisis. We will try and follow the model as much as possible by following the course of events. However, some events might be explained at an earlier stage compared to their occurrence in reality because it gives the reader a “flowing” understanding of the SCC and our analysis. A model is rarely perfectly compatible with reality.

It is important to emphasize that the analysis will not have the purpose of examining whether or not the Minsky-Kindleberger model is suitable in explaining financial crises in general but rather in analyzing the SCC through the use of the chosen theory.

Relevant insights from the Debt-Deflation theory will be included in different parts of the analysis on the macro level when appropriate.

Important arguments from the theories of Hamilton and Micklethwait and Lai will be used to analyze the behavior of the subprime mortgage lenders. “Bubble Psychology” will serve as the theoretical foundation of the psychological aspects of the behavior of subprime mortgage lenders and borrowers.

We will conduct our analysis on the LOLR actions of the Fed by applying a study in retrospect. An understanding of the responses of the Fed when faced with the challenges that the SCC has posed will form the basis of a discussion on the essential themes within the theory of the lender of last resort.

6.2.3 Critique on Theory

The Minsky-Kindleberger model is criticized by not operating with a clear cut definition of financial crises (Per H. Hansen, p. 17). Furthermore, the model operates on a macro level, thus not

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including relevant aspects such as the psychology of financial market participants during a bubble or corporate failures etc.

Fisher's theory is founded on the assumption that over-indebtedness leads to price deflation. However it is evidenced that debt-deflations in the US have been avoided via the assistance from the Fed to the financial system (Martin H. Wolfson, 1996, p. 315). This diminishes its relevance to the SCC but does not write off its ability to analyze the factors leading up to the crisis.

Theories on the micro level can be characterized as operating too narrowly, thus not providing the tools to analyze an extensive event, such as the SCC, independently.

The diverse opinions that characterize the theory on the LOLR are perhaps the most important points of critique on the subject. The ambiguous viewpoints presented by Bordo (1990), thus doesn't present a unified theory but multiple with various beliefs and conclusions on the topic. Therefore it is not possible for us to reach a single conclusion on the topic and we must therefore contend with a discussion of the responses of the Fed with the different schools of thought.

Another point of critique is the closed mindset of the different schools. Due to the assumptions of the authors as to the market and consequences of LOLR responses the recommended actions are inhibited. Therefore the models all do not consider a new model which is a hybrid depending on the situation.

7 Analysis

7.1 The years before the Subprime Credit Crisis

In order to obtain a thorough understanding of the SCC it is important to look at the performance of the U.S. economy in the years before the outbreak of the crisis.

During the 1990's the U.S. economy experienced an air of economical optimism and improvement. It was however first from the middle of the decade that the economy started to evolve rapidly. The unemployment rate in the US was lowered considerably after the Clinton administration came into power. The improvements continued till the unemployment rate in early 2000 reached its low point at a level of 4per cent which was the lowest since 1969.¹⁰ Macro economically this development brought with it accelerating incomes and prices.¹¹

The interest rate has throughout the 1990's been at a relatively low level especially compared to that of the 1980's.¹² It was lowered as a response to the recession threatening the US economy in the end of the 1980's and the beginning of the 1990's. As the interest rate is the price of money this development in the rate consequently eased the availability of money. Together with the decreasing unemployment rate these factors injected more money into circulation and contributed to the vast economical upturn of this decade. Moreover, the low interest rate level triggered an increase in real estate prices in the same period.

Above mentioned factors are considered to be a vital part of monetary policy as the federal institutions try to direct the condition of an economy. Furthermore, they traditionally have a subtle short term impact. So what made this economical upturn continue to evolve to unprecedented levels?

Even though the Internet had been around for some years it was not before the 1990's that it really had its breakthrough. The announcement in 1993 that the World Wide Web would become free for

¹⁰ <http://www.nidataplus.com/lfeus1.htm#annl>

¹¹ Christensen, Tom Nordin, "Inflationsudviklingen i USA og EU - "ny økonomi" ?", Danmarks Nationalbank, Økonomisk Afdeling, 1998

¹² <http://www.federalreserve.gov/releases/h15/data.htm>

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anyone¹³ is by many believed to be the starting point to this revolution¹⁴ - a revolution that indeed would turn out to affect nearly every aspect of life.

The new era ushered in the emergence of what was at that time unconventional types of companies - these were the so called dotcom's. Due to the low interest rates new companies had easy access to startup capital and combined with the technological breakthrough the U.S. market experienced a boom in the creation of dotcom's.

These were to a high degree characterized by heavy investments in the online sector in an effort to build up a brand or image that would grant them pioneer status and in the long run high market share. Many of these companies went public during their expansion and became quickly exposed to the speculative frenzy of the investment sector.

Dot-com's seemed in general to produce extreme growth rates, hereby becoming highly rated in the stock market. Investors - private as well as institutional - rushed to get a piece of the action with the anticipation of further rises. Alan Greenspan commented in 1996:

“ (...) Clearly, sustained low inflation implies less uncertainty about the future, and lower risk premiums imply higher prices of stocks and other earning assets. We can see that in the inverse relationship exhibited by price/earnings ratios and the rate of inflation in the past. But how do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions as they have in Japan over the past decade? (...) ”¹⁵

Investors got so caught up in the frenzy that a section of these quit their daily employment in order to pursue their luck as full time day traders. This term refers to individuals who sell and buy financial instruments and square these positions out within the same trading day.¹⁶ The only requirements to fulfill in becoming such a trader are a computer, Internet access and funds to invest.

¹³ <http://public.web.cern.ch/public/en/About/WebStory-en.html>

¹⁴“The Internet revolution may sound like a worn out cliché but for the financial services industry the impact of the Internet and e-commerce is only beginning and the effects will be dramatic”, The Banker, June 2, 1999

¹⁵ Greenspan, Alan, “The Challenge of Central Banking in a Democratic Society”, Remarks at the Annual Dinner and Francis Boyer Lecture of The American Enterprise Institute for Public Policy Research, Washington, D.C., December 5, 1996

¹⁶ <http://www.sec.gov/answers/daytrading.htm>

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At this point in time computers had become affordable to most, why this was no longer an obstacle. Day trading is usually associated with a high level of risk. However, with forecasts that share prices would only be going up, many of these day traders did not hold back from investing all of their wealth. Moreover, some private investors are described to have taken it one step further and financed their investments by lending.¹⁷

The picture is not much different when looking at the corporate sector. These were likewise characterized by heavy investments in the dot-com's and a major part of the invested funds were debt financed as the forecasts predicted profits to be higher than the lending rate. Moreover, many companies did not merely speculate in trading these shares but to a high degree simultaneously invested in high tech operations either by taking over the pioneers or trying to develop the technology themselves. However, this business model was far from bullet proof as a vast number of companies all had the same strategy of being the first to implement some revolutionary technology in one sector thereby obtaining monopoly status. Hereon after it was almost impossible for followers to catch up with the pioneer's rapid development and they were left back with huge deficits. In relations to this development the phrase "get large of get lost" was often used.¹⁸

In essence things in the period from the mid 1990's till the end of this decade seemed to develop extremely well. The majority of the population created great wealth and all markets in the US economy showed great performance, e.g. NASDAQ going from 600 to 5000 within a short period of time:¹⁹

Figure 4: NASDAQ



Source: MSN Money

¹⁷ "Is this the end of sticky prices?", *The Economist*, Vol. 347, Issue 8068, May 16, 1998

¹⁸ Spector, Robert, "amazon.com – Get Big Fast", *First Harper Business*, 2002

¹⁹ Smith, Richard M., "Privacy and the Dot-com Bubble", *Privacy Foundation*, December 27, 2000

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In times of prosperity the interest rate is increased by the central bank - the Federal Reserve in the U.S. - in an effort to prevent an overheating followed by a possible downturn in the economy. This is exactly what the Federal Reserve did in the U.S. by increasing the interest rate six times between 1999 and early 2000.²⁰ This put an end to the extreme development described above and the true state of the U.S. was exposed on the 10th of March 2000 - with the collapse of NASDAQ and consequently the burst of the so called dotcom bubble.²¹

The dot-com's had run with deficits in the entire upturn and after the burst of the bubble it resulted in many investors realizing that their holdings in these companies were worthless. Moreover, big corporations such as Enron, WorldCom and Global Crossing filed for bankruptcy²², further fuelling the downturn of the U.S. economy. It appears in figure 4 that the crash of the dot-com bubble wiped out approximately \$5 trillion in market value on NASDAQ between 2000 and 2002. These big corporations had a big impact due to their size. Many Americans became unemployed and many more had funds invested in these companies due to their "good" reputation as profit makers. The fall of these companies therefore shook the market to the extent that the majority of investors were left out of pocket hence becoming risk averse.

The recession is believed to have ended in November 2001 but the market was still feeling the after-effects of the crash. Many are therefore of the opinion that it took a longer period of time for the market to settle, especially in the high tech sector.²³ As mentioned, the NASDAQ declined sharply until 2002 and it was not before the end of this year that this index began to increase (cf. figure 4). Moreover, the 9/11 terrorist attacks further contributed to the slow recovery of the economy as it dealt further blows to the U.S. economy.

The real estate prices had since the 1990's been increasing due to the low interest rate levels in this decade. This created great wealth for many Americans in the form of rising equity in their property. As mentioned earlier, after the burst of the dotcom bubble investors became risk averse toward the stock market in general and with increasing real estate prices at this point in time, speculation in this section of the market quickly became the new frenzy. Moreover, former Federal Reserve Chairman, Alan Greenspan, decided to lower the short term interest rate to one per cent, thereby further

²⁰ "Fed's Rate Increase Fails to Dampen Rally on Wall St.", The New York Times, May 17, 2000

²¹ "The Dot-Com Bubble Bursts", The New York Times, December 24, 2000

²² Mainly caused due to accounting fraud and the failure in corporate governance.

²³ Porter, Eduardo, "Pockets of Concern Slow a Strong U.S. Economy", The New York Times, January 22, 2006

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fuelling the cycle.²⁴ Hereon after the U.S. real estate market experienced significant price increases and a bubble was rapidly under creation. Many economists believe that the burst of the dotcom bubble is one of the main reasons behind the creation of the real estate bubble. Yale economist Robert Shiller commented in 2005:

“Once stocks fell, real estate became the primary outlet for the speculative frenzy that the stock market had unleashed. Where else could plungers apply their newly acquired trading talents? The materialistic display of the big house also has become a salve to bruised egos of disappointed stock investors. These days, the only thing that comes close to real estate as a national obsession is poker.”²⁵

This bubble would turn out to burst as well on the 9th of August 2007.

7.2 Analysis on the Macro Level

7.2.1 Displacement

The increasing real estate prices and the low interest rate levels during the period after the recession of 2001-2002 brought with it improved profit opportunities for financial institutions as well as individual investors. Due to the positive correlation between prices and credit a surge for credit to finance investments in real estate cropped up. This was highly stimulated by the positive economic outlook of this era.

The US economy experienced a period of growth in the years to follow.²⁶ In light of the economic growth there arose optimism amongst investors and combined with the increasing profit opportunities and a credit expansion a boom was created.

²⁴ Cassidy, John, “The Minsky Moment”, The New Yorker, February 4, 2008

²⁵ Laing, Jonathan R., “The Bubble’s New Home”, Barron’s, June 20, 2005

²⁶ “U.S. productivity after the dot-com bust”, McKinsey Global Institute, December, 2005

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7.2.1.1 Innovation in Subprime Lending

“Displacement’ consists of events that change the situation, extend the horizon, and alter expectations. In such cases, otherwise rational expectations of some investors fail to take recognizance of the strength of similar responses by others.” (Kindleberger, 2005, p. 42)

Financial innovation in the subprime mortgage market can be characterized as being the main cause to have triggered the current financial crisis.²⁷ The boom encouraged lenders to carry out this type of innovation and made it seem riskless. Minsky emphasized that financial innovation is a typical feature in today’s capitalistic economy during a boom and that it eventually leads to increased investment:

“Innovations in financial practices are a feature of our economy, especially when things go well. (...) Increased availability of finance bids up the prices of assets relative to the prices of current output and this leads to increases in investment.” (Minsky, 1977, pp. 24-25)

This was also the case with the SCC as innovation in subprime lending increased investment in real estate and in instruments including MBS’s and CDO’s. However, this financial innovation would turn out to be quite damaging for the overall economy.

Subprime borrowers are, as opposed to prime borrowers, characterized by having a higher probability of default on their future debt obligations. This is due to subprime borrowers holding jobs that pay out low incomes, having poor credit histories and owning a small or no value in the form of assets.

During the boom these borrowers wanted a piece of the action in the real estate market. Under normal circumstances it would be difficult for this group to obtain a loan in order to finance the purchase of a house. However, as aforementioned, due to the positive economic outlook and increasing real estate prices lenders made it possible for subprime borrowers to obtain loans and invest in real estate through financial innovation. Financial institutions hereby saw the opportunity to make a quick profit with apparently no risk involved and subprime borrowers would, through

²⁷ Malmgren, Harald B., “The Credit Crisis Is Not Over”, The International Economy, Fall 2007

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these loans, obtain a short term surefire way to profit via speculation in real estate. This is what Kindleberger (2005, p. 42) referred to as '*extending the horizon and altering expectations*'.

Many have mainly delved on the question: How did financial innovation come about? This innovation in the economic playing field has many facets to its creation. However, in relation to the SCC many of these had their origins in the subprime mortgage lending market.

When raising a loan a borrower is usually offered financing of up to 80per cent of the purchase price of the house and the remaining 20per cent are usually covered in the form of a down payment. However, in relation to the subprime loans in question, borrowers were offered 100per cent of the financing of the house, also referred to as "piggyback" loans, i.e. no down payment required. The loans were divided into two simultaneous mortgages: one mortgage on 80per cent and another on 20per cent of the purchase price. The subprime borrowers then had two simultaneous mortgage obligations to meet.

Many of the loans issued included an adjustable interest rate, the so-called adjustable rate mortgages (ARM's). Lenders offered this type of loan to subprime borrowers, initially with very low teaser rates such that the initial monthly mortgage payments became manageable.

The lax lending practices in the subprime mortgage market were further implemented in the form of high risk taking on loans. It began with the "Low Doc" loans which referred to the lesser documentation required on loan taking by subprime borrowers. In time this evolved into "No Docs" and to "Liar Loans" because subprime borrowers were, at this point in time, urged to lie about their economic situation which is highly relevant to the application and the raising of the loan. Simultaneously subprime borrowers were not required any documentation.

7.2.1.2 The Contribution of Securitization and SIV's

The financial innovation of securitization has undoubtedly played a crucial role in the emergence of the current crisis. The securitization of home mortgages began in the early 1980s as banks and mortgage companies sought higher yields and turnovers whilst attempting to sidestep regulations on capital requirements. Minsky (1986) argues that this was a direct result of the monetary policy employed at the time. Here the Fed attempted to battle inflation with monetary growth thereby increasing the rates. For banks that had grown used to the so called "three-six-three"²⁸ model the

²⁸ Pay 3per cent on deposits, earn 6per cent on mortgages and hit the golf course at 3 pm.

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higher rates and less regulation opened the doors to a new form of business. A potentially more profitable but more risky form of business.²⁹

According to Minsky banks are by definition speculative finance units:

“Speculative units expect to fulfill obligations by raising funds by new debts. By this definition a “bank” with demand and short-term deposits normally engages in speculative finance.” (Minsky, 1977, p. 25)

However the following is an example of how financial innovation contributed to “units” turning their business into something that rather resembled Ponzi finance.

The MBS’s were the first step in the securitization of mortgages. Banks and mortgage companies would issue the loans and thereafter securitize them and sell them off to investors. This process is the so called “originate and distribute” model. The use of this model put these institutions in a most advantageous position as the sold off loans could be written off the books thereby lessening the capital requirements demanded by regulators.³⁰ The originators of the loans, i.e. banks and mortgage companies, would however still earn fee income from the origination and service of the loans.³¹ The model evolved to become most popular reaching a volume of \$3 trillion in 2005 in a US home mortgage industry of \$10 trillion.

The separation of ownership of assets from risk was a major factor in the increasing risk and reduction of the margin of safety as originators no longer had the incentive to perform due diligence in the issue of loans. Matters were however worsened as housing developers also entered the market for MBS. As these developers were only interested in selling their homes and had no interest in the risk of their issued loans they directly contributed to the worsening of matters.³²

In an attempt to make the MBS more desirable to investors another financial innovation was introduced in the early nineties. The CDO’s featured a bundle of MBS in the SIV’s divided into different tranches according to the individual yield and risk preferences of investors. As investors sought new opportunities after the equity markets crash in the beginning of the millennium these SIV’s filled a void and became hugely popular.

²⁹ “Lessons from the Subprime Meltdown”, p. 6

³⁰ “Old Wine in a New Bottle: Subprime Mortgage Crisis – Causes and Consequences”, p. 3

³¹ “Lessons from the Subprime Meltdown”, p. 8

³² “Old Wine in a New Bottle: Subprime Mortgage Crisis – Causes and Consequences”, p. 3

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SIV's were characterized by mainly investing in highly rated medium- and long term commercial paper, including subprime mortgage related assets.³³ These investments were mainly funded with short term ABCP and capital. Furthermore, financial institutions used some SIV's to move assets and liabilities off their balance sheets. The incentive came in the form of the less needed capital to meet bank regulatory requirements on off balance sheet. On the other hand, the risk involved was much higher, because SIV's were not eligible for LOLR help.³⁴

One might pose the question; why did financial institutions run the risk of operating through SIV's? One answer might lean on the irrational expectations of market participants on "ever rising" real estate prices. As long as prices continued to increase the "Originate and Distribute" model would hold. Another is related to moral hazard complications:

"A key topic is 'moral hazard' – if investors are confident that they will be 'bailed out' by a lender of last resort, their self-reliance may be weakened." (Kindleberger, 2005, p. 19)

Financial institutions are aware of their importance to the economy in general and thus aware of the Fed's reluctance to let the major players fail. An SIV in trouble is a bank in trouble and depending on its size, i.e. too big to fail, it is believed that the Fed will probably prevent the bank from collapsing as a collapse might spread to other financial institutions and other markets thus having devastating effects on the economy. However, as will be accentuated later in the thesis, this belief would turn out not to hold entirely.

Moral hazard revealed itself in another context. The incentive structure of these new financial instruments brought with it the perfect breeding ground for moral hazard as the originating party 'in practice' was isolated from risk. Thus due diligence was almost non existent as the popularity of these mortgages among investors increased. In an effort to achieve more turn-over, increasingly riskier securities were introduced. Subprime mortgages were offered to borrowers with weak credit, usually offered with teasers like minimal or zero down payment and low introductory adjustable rate mortgage (ARM).³⁵ As opposed to a fixed rate mortgage the interest rate of an ARM is closely correlated with movements in the Fed's funds rate, thus there is a higher risk involved in ARM's.

³³ Gallagher, Dan, "Citi says it will absorb SIV assets", Market Watch, December 13, 2007

³⁴ Cole, Marine, "Citi, HSBC moves signal bank SIV era's end", December 3, 2007

³⁵ "Old Wine in a New Bottle: Subprime Mortgage Crisis – Causes and Consequences", p. 2

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However, as long as the Fed kept its funds rate at a low level ARM's were edible. The teaser rates would reset at a predetermined time, usually within a period of 1-2 years, to a much higher level at which point the borrower would need to refinance with early payment penalties and additional fees paid to the originator as a result. This process has a striking resemblance to a Ponzi scheme as debt is financed with additional debt. Ponzi financing was used by Minsky to illustrate the increasing financial fragility of a system on the brink of collapse:

"(...) Ponzi finance – a situation in which cash payments commitments on debt are met by increasing the amount of debt outstanding. High and rising interest rates can force hedge financing units into speculative financing and speculative financing units into Ponzi financing. Ponzi financing units cannot carry on too long. (Minsky, 1977, p. 25)

By definition Ponzi financing is unstable in the long run. The debt refinancing imposed on borrowers in the SCC could only be maintained as long as more mortgages were driving up real estate prices and ensuring refinancing for borrowers. This cycle encouraged rising leverage ratios thereby leading to a more fragile financial system.³⁶

7.2.1.3 The Role of the Credit Rating Agencies

Financial innovation was behind the construction and implementation of aforementioned complex credit products, such as MBS' and CDO's, to the market. The complexity further contributed to the minimal information amongst end investors in regards to the assessment of the underlying credit quality of these infamous products. This resulted in end investors having to rely heavily on the ratings of credit rating agencies.

However, there is the issue of conflict of interest as credit rating agencies are being paid by issuers whilst simultaneously rating their structured credit products. Rating agencies have thus come under heavy criticism from the media since the outbreak of the SCC.³⁷ The critique is mainly concerned on the high credit rating on many securitized assets containing subprime mortgages. It is believed that these ratings were unavoidable because if the credit rating agencies did not deliver good ratings to the issuers who pay them for their services the issuers would simply choose another rating

³⁶ "Lessons from the Subprime Meltdown", p. 11

³⁷ Moore, Elaine, "Rating the credibility of credit agencies", Financial Times, November 16, 2007

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agency.³⁸ Thus, it was implicitly given that the rating agencies would rate MBS's and CDO's higher in order not to lose business to competing agencies.

The good credit ratings on many MBS's and CDO's reassured end investors that investing in these securities included a low level of risk. When taking account for the uncertainty in this regard and end investor's dependence on these ratings, credit rating agencies thus contributed to the increasing investment in MBS's and CDO's and to the subsequent SCC.

7.2.2 Euphoria/Overtrading

“Speculation involves buying commodities for the capital gain from anticipated increases in their prices rather for their use. Similarly speculation involves buying securities for resale rather than for investment income attached to these commodities.” (Kindleberger, 2005, p. 25)

Within a short period of time after the recession of 2001-2002 and during the subsequent boom a speculative frenzy in real estate was under creation. At this point in time many individual investors were characterized by buying a house with the expectation of a short term surefire way to profit and not because of its main purpose: providing a roof over one's head in the long run. Lim (2008) explains:

“Many subprime borrowers has counted on being able to refinance or repay mortgages early through home sales and at the same time produce some equity cushion in a market where home prices kept rising” (Lim, 2008, p. 7)

People saw others get rich fast by speculating in housing. Kindleberger wrote:

“There is nothing as disturbing to one's well being and judgment as to see a friend get rich. (...) Similarly banks may increase their loans to various groups of borrowers because they are reluctant to lose market share to other lenders which are increasing their loans at a more rapid rate. More and more firms and households that previously had been aloof from these speculative ventures

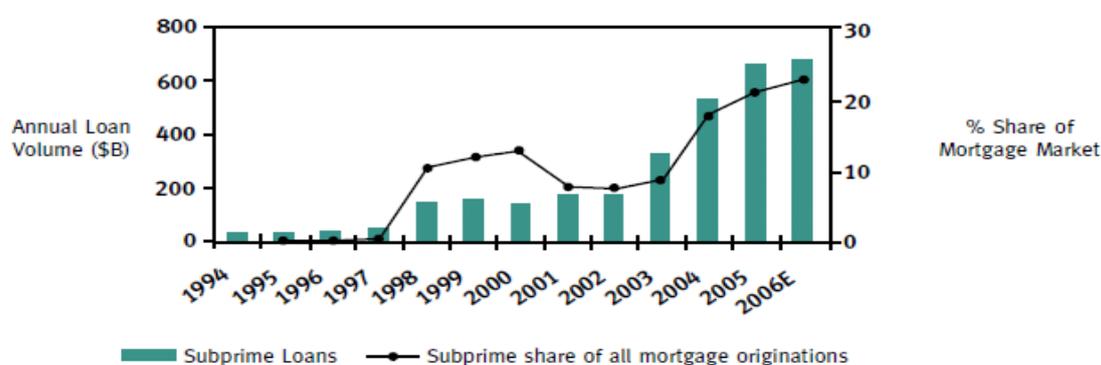
³⁸ Whalen, Charles, “Understanding the Credit Crunch as a Minsky Moment”, M. E. Sharpe Inc., Challenge, vol. 51, no. 1, January/February 2008

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begin to participate in the scramble for high rates of return. Making money never seemed easier. Speculation for capital gains leads away from normal rational behavior to what has been described as a 'mania' or a 'bubble'” (Kindleberger, p. 25)

Initially it did go the right way as those who borrowed, experienced an increase in their net worth due to the continuation of the increasing real estate prices. This did not go unnoticed amongst potential subprime borrowers who quickly followed the steps of those who initially entered the market.

Figure 5: Subprime Mortgage Market Growth and Share of Total Mortgage Market



Source: Center for Responsible Lending

It appears in figure 5 that subprime lending accounted for ten per cent of the total mortgage bond market in 2002 and by 2006 it had reached an all time high level of one fourth of a total mortgage bond market with an estimated worth of 6 trillion dollars.³⁹ This development is an indication of the increase in mortgage lending to subprime borrowers and thus an indication of overtrading and higher risk taking.

Overtrading was further evidenced via lenders taking lending practices to the level of no risk assessment in regards to borrower's financial situation and increasing the number of originated mortgage loans. Kindleberger wrote:

³⁹ "The downturn in facts and figures", BBC News Online, November 21, 2007

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“(...) in periods of economic euphoria the quantity of debt increases because the lenders and investors become less risk-averse and more willing – or less unwilling – to make loans that had previously seemed too risky.” (Kindleberger, 2005, 63)

It occurred through the so-called “NINJA” loans which were characterized by lenders not requiring documentation regarding the borrower’s occupation/job, income and assets.⁴⁰ As a result NINJA loans contributed to the maximization of the probability of default if the trend in real estate prices was to turn around. In regards to these “innovative” lending practices and the related behavior of lenders one could discuss whether or not it could be characterized as fraudulent. However, this is a topic we will dig deeper into later in the thesis.

These practices and the related risk management were based on the future forecasts of rising real estate prices and an economy in continuing growth. This subsequently made lenders and borrowers deviate from rationality and act euphorically and irrational on the supposed “easy” profit opportunities.

Minsky emphasized that Fed intervention is important because it prevents a debt-deflation from occurring and thus results in the US economy recovering rather quickly from a recession. However, LOLR assistance can lead to inflation:

“Once endogenous processes take the economy to the brink of a crisis, Federal Reserve intervention can abort the development of a full-fledged crisis and a debt deflation. (...) As a result the economy recovers rather quickly from the recession but because the Federal Reserve invention has protected various financial markets, the recovery can soon lead to a resumption of an inflationary boom.” (Minsky, 1977, p. 26)

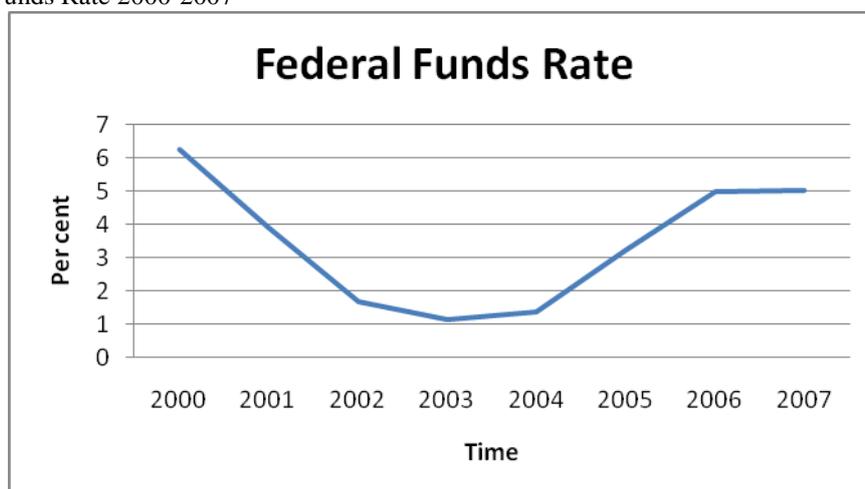
Fed’s attempt to battle the recession also brought with it a very low interest rate level. In figure 6 is depicted the development in the federal funds rate⁴¹ between 2000 and 2007:

⁴⁰ Pearlstein, Steven, “No Money Down’ Falls Flat”, The Washington Post, March 14, 2007

⁴¹ The federal funds rate is the rate at which financial institutions can lend from the Fed. However, the development in this rate reflects the development in the consumer interest rate, thus it is highly usable in this regard.

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Figure 6: Federal Funds Rate 2000-2007



Source: The Federal Reserve

Between 2002 and 2004 interest rates were kept under 2 percent, reaching a low of one percent in 2003. This brought with it an excessive money supply into the market and subsequently a rise in the inflation rate. Thus, the low interest rates made it cheaper to borrow money and with rising real estate prices this also had its say in the formation of the euphoric enthusiasm. As Fisher noted:

"The over-indebtedness (...) may be started by (...) new opportunities to invest at a big prospective profit... Easy money is the great cause of over-borrowing. When an investor thinks he can make over 100 per cent per annum by borrowing at 6 per cent, he will be tempted to borrow, and to invest or speculate with borrowed money." (Fisher, 1933, p. 348)

The tide is divided in regards to the importance of the Fed's lowering of the interest rate level. Whilst business cycle scholars are of the opinion that the cut is a part of the bigger picture (Wray, 2007; Lim, 2008; Feldstein, 2007), monetarists are inclined to think that it is the main cause to the SCC (Goodhart, 2007; Bordo, 2007; Crouhy and Turnbull, 2008). Minsky wrote in 1977:

"(...) financial fragility and thus the susceptibility of our economy to disruption is not due to either accidents or policy errors." (Minsky, 1977, p. 140)

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And Schwartz wrote in 1986:

“It is not financial distress that triggers a crisis. The failure of authorities or institutions to respond in a predictable way to ward off a crisis and the private sector’s uncertainty about the response are the triggers of a real financial crisis.” (Schwartz, 1986, p. 12)

Thus, according to the monetary school of thought, the low interest rate environment generated by the Fed is what triggered the SCC. Goodhart (2007), among others, accentuates that the period of monetary expansion, the low interest rate level and the “Greenspan Put”, i.e. the Fed providing a safety net for financial markets, all were interventions from the Fed and combined caused the SCC (Goodhart, 2007, pp. 332-334).

Nonetheless, an atmosphere of euphoria would soon turn out to be substituted by a period of financial distress.

7.2.3 Financial Distress

While everything seemed to be going well in the US economy and especially in the real estate market economic forecasters began to question whether or not the experienced development and growth was sustainable in the long run.⁴² These warnings and concerns were however lacking credibility at this point in time because of the fact that real estate prices were soaring and of the belief of a “new era”. Minsky further elaborates:

“Success breeds a disregard of the possibility of failure... As a previous financial crisis recedes in time, it is quite natural for central bankers, government officials, bankers, businessmen, and even economists to believe a new era has arrived.” (Minsky, 1986, p. 213)

As an example, Greenspan did on the 23th of February 2004 praise the virtues of ARM’s and warned borrowers of the high fees charged on fixed rate mortgages, thus accentuating that borrowers pay too high a price for the protection against rising interest rates and for the right to

⁴² Weldon, H. W., “Real Estate: Headed For a Fall?”, Business and Economic Review, January/March 2004

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refinance.⁴³ Moreover, Greenspan publicly downplayed the possibility of a real estate bubble on a national level:

“Is the housing market less prone to bubbles than the stock market? Alan Greenspan thinks so, arguing in a recent speech that the transaction costs of buying and selling a home are much higher than in the stock market and that this is likely to discourage speculative trading in houses. Moreover, he says, arbitrage opportunities are much more limited in housing markets than in securities markets. A home in Portland, Oregon, is not a close substitute for a home in Portland, Maine, so even if a bubble were to develop in a local market, it would not inflate a national bubble.”⁴⁴

Statements made by Greenspan did at that time, and still to some extent today, have great effect on the public opinion, thus contributing to the increasing demand for ARM's. However, there is broad consensus in the media that Greenspan should have known better and not contribute to the increasing public speculation in real estate.⁴⁵

Kindleberger accentuated that timing is of outmost importance but highly complex, as it is difficult to determine the exact point in time to express ones concerns publicly (Kindleberger, 2005, p. 80). When the first forecasters led out their concern they had all the facts against them as everything seemed to be going in the right direction. However, the Fed would after 2004 increase its funds rate considerably in order to prevent the US economy from overheating (see figure 6). This brought with it rising interest rates all over the American business spectrum. Most importantly, this resulted in a rise in borrowing costs in the housing market thus it became more expensive to finance a house and to cover mortgage payments.

Bordo (2007) emphasizes that the interest rate increase was the cause to the burst of the real estate bubble:

“The bust was likely induced by a rise in rates in reaction to the inevitable inflationary pressure.”
(Bordo, 2007, p. 3)

⁴³ Greenspan, Alan, “Understanding household debt obligations”, Speech at the Credit Union National Association 2004 Governmental Affairs Conference, Washington, D.C., February 23, 2004

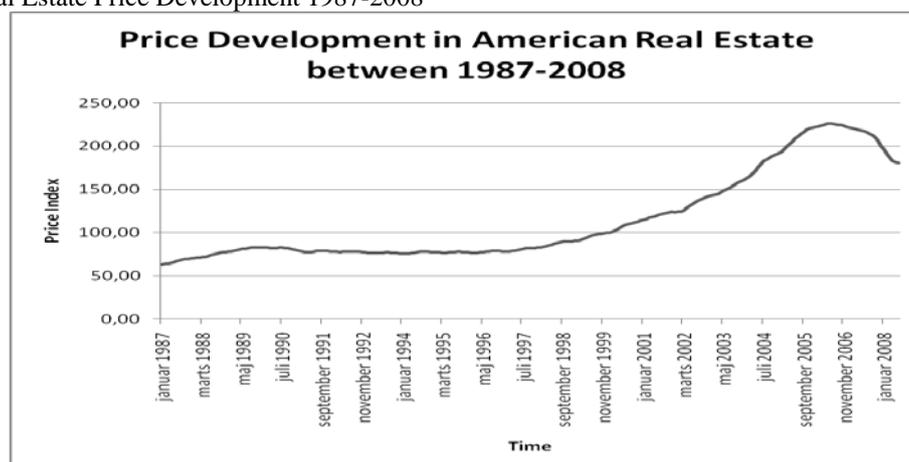
⁴⁴ ”Design flaws”, The Economist, Vol. 367, Issue 8326, May 29, 2003

⁴⁵ Andrews, Edmund L., “Greenspan Says Housing Boom Is Nearly Over”, The New York Times, August 28, 2005

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Financial distress is likely to follow the decrease in prices (Kindleberger, 2005, p. 77). Those who initially cried wolf would in early 2005 receive a fertile soil in relations to their concerns. This was due to the first observations on decreasing real estate prices in some US states. This was by many ‘irrationally unanticipated’ and the opposite of future forecasts at that point in time. It did nonetheless send some minor shockwaves throughout the real estate- and lending market as investors and lenders would wait to see if this would turn out to be a trend for the near future to come on a national level. And so it did. In figure 7 is depicted the price development in American real estate between 1987 and 2008, with 1987 as index 100. The figure shows that the development in domestic real prices – or the real estate bubble as many choose to call it – came to a halt in mid 2006. Thereon after real estate prices began to fall.

Figure 7: US Real Estate Price Development 1987-2008



Source: Standard & Poor's

“The change in the mind-sets of investors from confidence to pessimism is the source of instability in the credit markets as some borrowers – individuals as well as firms – realize that their indebtedness is too large relative to their incomes. These borrowers begin to adjust to their new perceptions about the economic future by reducing their spending so they will have the cash to pay down debt or to increase saving. (...) The lenders recognize that they have too many risky loans and so they seek repayment of outstanding loans from the borrowers that they deem most risky; they become reluctant to renew these loans as they mature. The lenders also raise the credit standard for new loans.” (Kindleberger, 2005, pp. 77-78)

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In the period to follow the decreases were minimal but occurred on a broader spectrum and investors slowly began to switch from confidence to pessimism. As mentioned earlier, the speculative frenzy in real estate had led many to take on very high levels of debt in order to profit from the supposed price increases. In the state of pessimism many borrowers came to realize that their debt-to-income ratio was relatively high. These borrowers would then begin to reduce their investments and spending in order to be able to meet their new and higher mortgage payments or increase savings in order to create a safety net for the “insecure” future to come.

Lenders were likewise reassessing their situation and it was not difficult to realize that the lending to subprime borrowers was risky and with the tendency of decreasing real estate prices many of these borrowers would find themselves with a house worth less than the mortgage obligation on the house. Moreover, many of these borrowers did not have the incomes to cover the rates charged as one might remember that subprime borrowers initially were offered teaser rates that would reset to considerably higher rates, thus increasing the probability of default. This setup only made sense as long as real estate prices kept increasing. The subsequent result was that lenders denied existing subprime borrowers to renew their mortgage loans because they evaluated that the risk was, in this new scenario, too high and the subprime borrowers were likely not to be able to repay the loans.⁴⁶ Simultaneously lenders began in general to tighten their lending practices, thus deviating from the risky practices implemented in the subprime lending market. Subsequently this course of events led to an increasing instability in the lending market.

It is always difficult to predict where an economic development is headed and even harder to convince the public that things might turn bad when the state of the economy seems to be doing better than ever. However, when real estate prices were falling across the American soil in mid 2006 those who had expressed their concerns earlier in the course of events more or less restated their warnings and added a “I told you so”.⁴⁷ This contributed heavily to the loss of confidence in several markets, especially the subprime mortgage market.

One might argue whether the US Government, at this stage, should have made serious attempts at calming the public and financial institutions by reassuring that ‘everything is going to be alright’

⁴⁶ Budden, Robert and Ching, Lucy Warwick, “Surge in bad debts forces lenders to tighten criteria”, Financial Times, August 26, 2006

⁴⁷ Reason, Tim and Leone, Marie, “FASB on Subprime: We Warned You”, CFO.com, May 1, 2008

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and accentuated that house prices had deviated from fundamentals and ‘minor’ disturbances would occur in the immediate future.

The aforementioned teaser rates offered to subprime borrowers were usually charged in the first year or two of the mortgage loan. As subprime loans accelerated after 2003 and 2004 due to the very low interest rate level and the appreciating real estate prices many of these borrowers were finding themselves paying or having to pay the high “real” interest rates by 2005 and 2006.

“(…) these investors anticipated that they would be able to use the increase in the value of the asset as collateral for new loans that would provide them with some of the cash that they would need to pay the interest on the outstanding loans. When asset prices stop increasing, these investors are shunted into distress mode since they have no ready way to get the cash they need to pay the interest on their outstanding indebtedness. (...) Credit in the domestic credit market might become less readily available – tighter – because of a reduction in the reserves of the banking system” (Kindleberger, 2005, p. 83)

However, as real estate prices were falling many subprime borrowers were quick to realize that it was no longer profitable for them to keep meeting their obligations because the value of the loan was higher than the one for the house. The subsequent result was that many subprime borrowers chose to default on their mortgage loans through 2006 and 2007 and a credit crunch became a reality as financial institutions held back on lending. Chairman of the Fed Ben Bernanke said in a speech on 20 July 2007:⁴⁸

“The credit losses associated with subprime have come to light and they are fairly significant... Some estimates are in the order of between 50 and 100 billion US dollars of losses.” Ben Bernanke, Speech at the Senate Banking Committee, 20 July 2007

These estimations from Bernanke were immediately ridiculed due to the magnitude of the SCC. The point was that it was not merely in the subprime lending market that losses would incur. Due to financial innovation and the structured products based on subprime mortgage loans many of the

⁴⁸ “Fed warns of \$100bn credit losses”, BBC News Online, July 20, 2007

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institutions that had been speculating in these would get hit. Jan Hatzius, chief economist at Goldman Sachs New York, commented on Bernanke's estimations in a mid November report 2007:

“Those numbers are too low... Based on historical default and loss patterns in different home price environments, US losses will be roughly US\$400 billion.” Jan Hatzius, 2007, Chief Economist at Goldman Sachs Group

According to Kindleberger financial distress is a reality when:

“Financial distress for an individual firm means that its profitability has declined sharply so that it is incurring significant losses so there is a non-trivial probability that the firm will not be able to pay scheduled interest on its outstanding debt. Financial distress for an economy also has a prospective significance and implies the need for economic adjustments; firms may be on the verge of bankruptcy and banks may need to be re-capitalized. Many investment projects may be far from completion because the developers can no longer obtain the finance necessary to complete the construction” (Kindleberger, 2005, 81)

During July 2007 there was a significant round of subprime MBS rating downgrades and on the 18th of July 2007, Bear Stearns makes a public announcement that two of its hedge funds would not be able to pay out to their investors due to the refusal from rival banks to bail out the hedge funds.⁴⁹ This was a top tier investment bank that with this statement, everything else equal, did send a shock wave throughout the American market.

During the following week, the Dow Jones share index suffered its worst decline in almost five years with a fall of 4.2 percent. By this point in time, confidence was undermined by the fear about the number of banks that had engagements in subprime related investments.⁵⁰

7.2.4 The Crisis

According to Kindleberger (2005, p. 94) a financial crisis may include a crash and/or a panic and in either order. A crash refers to the collapse of assets prices or the failure of an important institution,

⁴⁹ “Timeline: Global credit crunch”, BBC News Online, October 20, 2008

⁵⁰ “Timeline: Global credit crunch”, BBC News Online, October 20, 2008

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being either a bank or a firm. A panic refers to trouble in assets market or a rush from less liquid securities to money or government securities.

The Minsky-Kindleberger model however leans on Fisher's Debt Deflation Theory when explaining the occurrence of a financial crisis (2005, pp. 89-96). Minsky said:

"A financial crisis starts when some unit cannot refinance its position through normal channels and is forced to raise cash by unconventional instruments or by trying to sell out its position. (...) excess supply leads to a sharp price break. Once this occurs the initial disequilibrium is made worse. Other units experience a decrease in asset values and thus have difficulty in making position. (...) a financial crisis is a necessary and apparently sufficient condition for a deep depression." (Minsky, 1977, p. 140)

Kindleberger accentuates that a bank failure or a firm bankruptcy may trigger a financial crisis. Banks begin to hold back on lending, calling in loans and more collateral. Distress liquidation of assets occurs in the market. Then investors and banks scramble for "high powered money", panic hits the market and a run on a bank may occur. Subsequently several banks may experience a run unleashing a banking crisis. In worst case scenario this course of events may lead to liquidity problems and a depression, affecting the real economy significantly. But the main contributing factors to a financial crisis are increasing debt and decreasing assets prices.

The described course of actions shows that over-indebtedness on the broader spectrum was a reality. Fisher (1933) emphasized:

"When over-indebtedness stands alone, that is, does not lead to a fall of prices, in other words, when its tendency to do so is counteracted by inflationary forces (whether be by accident or design), the resulting cycle will be far milder and far more regular. (...) it is the combination of both which works the greatest havoc." (Fisher, 1933, p. 344)

By both he obviously refers to over-indebtedness leading to price deflation. At this point in time, and still ongoing, it is a question of combating deflation and thus preventing a depression from occurring in the US economy. The following provides an examination of the outbreak of the crisis so far and the efforts made to stabilize the situation by fighting deflation.

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7.2.4.1 The Subprime Mortgage and Credit Crisis

On the 9th of August 2007 the SCC was a reality when, ironically enough, a French investment bank, BNP Paribas, announced to its investors that:

*“The complete evaporation of liquidity in certain market segments of the US securitization market has made it impossible to value certain assets fairly regardless of their quality or credit rating. The situation is such that it is no longer possible to value fairly the underlying US ABS assets in the three above-mentioned funds. We are therefore unable to calculate a reliable net asset value (“NAV”) for the funds. (...) The valuation of these funds and the issue/redemption process will resume as soon as liquidity returns to the market allowing NAV to be calculated.”*⁵¹

This announcement did send significant shock waves through the sensitive money market and the wreaking of havoc had now begun.⁵²

7.2.4.2 Panic Amongst Financial Institutions

The announcement may have come from a French investment bank but it did nonetheless disclose the lack of confidence amongst financial institutions, including US banks, and their refusal to do business with each other. The initial fright was the possible occurrence of a high customer demand for cash, the so-called run on banks. As a result, funds began to shift from medium- and long term bank deposits and commercial paper to short term maturities. Subsequently, this created a high demand for short term liquidity and the breakdown of the ABCP market.⁵³ In general, at this early stage there was a lack of incentives to lend at longer maturities, because it was unknown how many banks were in trouble and of the extent of losses. The risk of lending to each other was simply too high at this point in time.

⁵¹ <http://www.bnpparibas.com/en/news/press-releases.asp?Code=LPOI-75W9PV>

⁵² “BNP Paribas freezes three securities funds amid subprime market problems”, The International Herald Tribune, August 9, 2007

⁵³ Dodd, Randall and Mills, Poul, “Outbreak: U.S. Subprime Contagion”, International Monetary Fund, Vol. 25, Number 2, June 2008

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7.2.4.3 SIV's and the Crash in ABCP Market

Remember the SIV's? These off balance sheet entities had financed their investments in medium- and long term commercial paper with ABCP and capital of which bank debt was the main underlying asset. With the breakdown of the ABCP market SIV's came into heavy financial trouble and turned to the sponsor banks for help, because SIV's were not eligible for Fed assistance. Banks did initially lend to these entities and had shortly after to decide whether or not they would bring SIV's officially to their balance sheets. Some banks did and expanded the amount of capital required and some did not, leading SIV's to sell out assets and thus forcing investors to incur losses. Citigroup was one of the major American banks that decided to absorb the assets – worth at the time of the announcement \$49 billion – of the seven SIV's it sponsored on to their balance sheets. The entities of Citigroup accounted for one fifth of the total assets held by all SIV's at this point in time. It is believed that Citigroup feared that if it had let its SIV's to sell out all the “toxic” assets in order to raise cash to meet their obligations, the public fire sale, that likely would have followed, would show that the assets were worth far less than if Citigroup carried them on their balance sheets.⁵⁴ A fire sale would result in major write downs amongst all institutions that were holding these assets or were sponsoring SIV's, thus increasing the threat of bankruptcy. In essence, by bringing the SIV's on to their balance sheets, Citigroup were buying time and stalling a series of possible bankruptcies in the market.

A fire sale was not only of interest to Citigroup but certainly to the market in general why several financial institutions followed the example of Citigroup. Even institutions without any SIV exposure, like Bank of America and J.P. Morgan Chase, decided to help the exposed financial institutions because a fire sale might have triggered a downgrade on other asset groups.

7.2.4.4 Illiquidity in the Interbank Lending Market

Banks also came under stress in regards to funding themselves in wholesale markets. They therefore began to scramble for high powered money by holding low risk cash-like assets whilst trying to reduce the lending to other banks. However, banks had to stand by their existing loan commitments that they rather would have liked to avoid. Simultaneously, banks experienced difficulty in raising

⁵⁴ Harrington, Shannon D and Hester, Elizabeth, “Citigroup Rescues SIVs With \$58 Billion Debt Bailout”, Bloomberg, December 14, 2007

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more funds by selling out on their loans, thus being compelled to keep the loans on their books. This brought with it a significantly high level of illiquidity in the American interbank market.⁵⁵

7.2.4.5 The Collapse of a Giant

*“When counterparty credit concerns are high and liquid assets are being hoarded, even solvent banks can find it difficult to remain funded.”*⁵⁶

This is precisely what happened to Bear Stearns. The investment bank suffered a wholesale market run despite assurances from the Fed that Bear Stearns exceeded regulatory capital requirements. The bank ate into its \$17 billion liquidity reserve in just a couple of days even as the Fed and J.P. Morgan Chase were negotiating a bail out during March 2008.⁵⁷ It took 85 years for this titan of Wall Street to be built and only four days for it to be dissolved. This goes to show how fragile the trust in wholesale markets is and how fast a firm can become illiquid when its reputation is tarnished and when markets are illiquid.

American banks were in general reluctant to take on liquidity support from the Fed because by doing so they might send a negative signal to the market of liquidity problems. A tarnished reputation might thus put them in the same situation as Bear Stearns. As a result the Fed developed a new setup, the Term Auction Facility, which allows Banks to bid anonymously on what interest rate they want to pay when they want to borrow money from the Fed. The aim was to minimize the generate market rumors in this regard.⁵⁸

7.2.4.6 Downgrading of Bond Insurers

All who had been engaged in subprime related assets burned their fingers. Bond insurers, also called monoline insurers, were certainly not an exception. These are characterized by guaranteeing

⁵⁵ Whitney, Mike, "Are the banks in trouble?", Online Journal, September 10, 2007

⁵⁶ Dodd, Randall and Mills, Poul, "Outbreak: U.S. Subprime Contagion", International Monetary Fund, Vol. 25, Number 2, June 2008

⁵⁷ Kennedy, Siobhan and Jagger, Suzy, "Despite the Federal Reserve's efforts Wall Street fears a big US bank is in trouble", Times Online, March 13, 2008; Thomas Jr., Landon, "Bear Stearns gets a lifeline from Fed and a rival", The International Herald Tribune, March 14, 2008

⁵⁸ Nicholas, Gibran, "The Federal Reserve Lowers Interest Rates AGAIN... What Does This Mean For YOU?", CMPS Institute

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the repayment of loans when an issuer defaults.⁵⁹ In recent years American monoline insurers, especially two of the largest, MBIA Insurance Corp. (MBIA) and Ambac Assurance Corp. (Ambac), began to provide insurance on structured products such as subprime mortgage backed bonds and CDO's. They experienced growth and reinforced AAA ratings via these engagements though without assessing the risk involved.⁶⁰

The collapse in the subprime mortgage lending market and the subsequent collapse in subprime mortgage backed securities increased the liabilities to the insurers and led to the downgrading of the monoline insurers who consequently were put on watch by the credit rating agencies.⁶¹

On the 18th of January 2008 the rating agency Fitch downgraded the rating of Ambac from AAA to AA. On the 5th of June 2008 the rating agency, Standard and Poor's (S&P), downgraded the rating of both MBIA and Ambac likewise from AAA to AA.⁶² Rating agency Moody's followed and on the 19th of June 2008 likewise downgraded the rating of both insurers. The market did not hesitate to react as the downgrading from S&P and Moody's resulted in Ambac dropping 52per cent and MBIA 31per cent. Since the outbreak of the SCC, Ambac has lost a total of 93per cent of its value and MBIA are down 87per cent.⁶³ The total market loss for these two insurers combined is currently estimated to be a minimum of \$20 billion.⁶⁴

It is too early to determine the total effects of the downgrades on monoline insurers. However, on the day of the downgrades, financial institutions experienced declining share prices because the structured credit insured by the monoline insurers no longer was risk free, thus banks were facing even more massive write downs; the cost of insuring debtors' debt against default has also increased; bonds had to be re-rated to lower values; investors had to take the market value losses and the lower rating will make it more difficult for monoline insurers to take on new business.

7.2.4.6.1 The fall of US Municipal Bonds

MBIA and Ambac both started out in 1970's as insurers of US municipal bonds. The American state and local governments were not strong enough by themselves to qualify for an AAA rating,

⁵⁹ "Timeline: Global credit crunch", BBC News Online, October 20, 2008

⁶⁰ Chapman, Chris, "Everything you ever wanted to know about monoline insurers", Finance Week, June 18, 2008

⁶¹ Dodd, Randall and Mills, Poul, "Outbreak: U.S. Subprime Contagion", International Monetary Fund, Vol. 25, Number 2, June 2008

⁶² <http://www2.standardandpoors.com/portal/site/sp/en/us/page.article/4,5,5,1,1204836906732.html>

⁶³ Retrieved from Bloomberg News, "MBIA and Ambac Fall on Ratings Fear", The New York Times, January 18, 2008

⁶⁴ Richard, Christine, "Bill Ackman Was Right: MBIA, Ambac on `Ratings Cliff'", Bloomberg News, June 18, 2008

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thus by being backed up by a monoline insurer they minimized their borrowing costs.⁶⁵ Through the insurance of the municipal bonds, monoline insurers almost turned them into commodities and they were subsequently referred to as “sleep assurance”.⁶⁶ This was safe business for insurers, issuers and investors.

However, when monoline insurers “joined everybody else” and began to provide insurance to subprime mortgage backed products the risk exposure increased dramatically. As afore mentioned, MBIA and Ambac subsequently lost their AAA rating which turned out to affect municipal bonds dramatically.

More than half of the outstanding municipal bonds, with an estimated worth of \$2.6 trillion, were insured by monoline insurers.⁶⁷ Being the two biggest monoline insurers in the US, MBIA and Ambac accounted for the majority of these insurances. The downgrading erased the insurance on municipal bonds, made these more risky and consequently less valuable. As some investors were only allowed to hold AAA rated bonds these were forced to sell out on their holdings in municipal bonds, thus the value of municipal bonds experienced a further significant fall in the market.⁶⁸ Furthermore, some issuers, such as municipalities and other governmental institutions, lost their access to the bond markets and were forced to borrow money at higher rates to fund public projects. It was not only the municipal bond market that suffered on the downgrading of monoline insurers. Institutions in other segments, such as the student loan market, that took on insurance services from monoline insurers were likewise hit.⁶⁹

7.2.4.7 Freddie Mac and Fannie Mae on the Front Page

The SCC and the credit crunch have resulted in the collapse of many firms, banks and other institutions. However, none would have had a greater impact than if the American federal government had allowed Fannie Mae and Freddie Mac to collapse.

Freddie Mac and Fannie Mae are mortgage companies that help Americans acquire homes via buying mortgages from banks, grouping them into bonds and selling them to investors with a

⁶⁵ “The bond problem”, *The Economist*, February 3, 2008

⁶⁶ Mysak, Joe, “Insurer Collapse Means Buying Muni Bonds in the Raw”, *Bloomberg News*, July 25, 2008

⁶⁷ Morgenson, Gretchen, “A bond market, starved for sunshine”, *The International Herald Tribune*, August 17, 2008

⁶⁸ Cho, David, “Municipal Bond Deals Squeezed By Credit Crisis”, *The Washington Post*, November 29, 2007

⁶⁹ Associated Press, “Credit jitters spread to student loan market”, December 10, 2007

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guarantee to be paid.⁷⁰ In the mortgage market, also including subprime mortgages, these two institutions account for approximately 50 percent of all American home loans – a whopping \$5.2 trillion.⁷¹ Since the outbreak of the SCC, each of these institutions has lost more than 60 percent in market value.⁷² This is mainly caused by the turmoil in the mortgage market and the decreasing real estate prices.

On September 7th 2008 the federal government took over the total control of the two government-sponsored enterprises.⁷³ If the government had not intervened the consequences would have been disastrous due to the sheer size of the two giants. The chain of disasters that then would have been unleashed could have led the US economy into a depression.⁷⁴ Time will only tell if the US government, via this intervention, merely postponed or eliminated the possibility of a depression.

7.2.5 International Contagion

Kindleberger (2005) accentuates in his theory that financial crises tend to spread on an international level, because of the interrelation and interdependence between national economies. However, due to the extent of this thesis, we are compelled to only focus on the US economy, thus deviating from treating the relevant effects of the SCC on an international level. That said it is important to point out that the SCC has its origins in the subprime mortgage lending market but has nonetheless spread onto many other markets and ultimately could affect the real economy.

7.2.6 The Federal Reserve as LOLR

Kindleberger (2005, pp. 176-194) distinguishes between two policy responses in regards to coping with a financial crisis; letting it burn out or LOLR assistance. In the case of the SCC policymakers could not let this financial crisis burn out because it would have disastrous consequences, thus the Fed has made several attempts to minimize the market losses.

The Fed's LOLR interventions and the implications of these are explained and discussed in part 3 of the analysis.

⁷⁰ "Background: Fannie Mae and Freddie Mac", CNN News Online, July 13, 2008

⁷¹ Morgenson, Gretchen, "What Will Mac 'n' Mae Cost You and Me?", The New York Times, August 23, 2008

⁷² Duhigg, Charles, "Fannie Mae and Freddie Mac shares plunge as fears worsen", The International Herald Tribune, July 8, 2008

⁷³ Christie, Rebecca and Kopecki, Dawn, "Paulson Engineers U.S. Takeover of Fannie, Freddie", Bloomberg News, September 7, 2008

⁷⁴ Benner, Katie, "The Fannie and Freddy doomsday scenario", CNN News Online, July 11, 2008

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7.2.7 Sub Conclusion

We have found that the displacement in regards to the SCC is the financial innovation in the subprime mortgage lending market.

During the housing boom lenders followed lax lending standards which made it possible for subprime borrowers to enter the real estate market, even though many of them did not possess the financial foundation to do so. Amongst other things, they were attracted with ARM's and teaser rates that within a couple of years would reset to a much higher level.

Via the "Originate and Distribute" strategy and the help of credit rating agencies, financial institutions issued unsecured subprime loans, securitized them and sold them off to investors. This enabled financial institutions to write loans off their books and onto the SIV's and essentially expanding their lending business by originating more loans. Many of these loans were given to subprime borrowers who were characterized by having an unstable financial situation.

The incentives behind financial innovation – the culpable behavior amongst subprime lenders – were the soaring real estate prices and the very low interest rate level during 2002/2003 till 2005. This resulted in the boom being financed by the expansion of credit.

Rating agencies were confronted with conflicts of interest as they are paid by issuers whilst simultaneously rating their structured credit products. Nonetheless, due to the lack of transparency, end investors relied on their ratings which contributed heavily to the increased trading in e.g. MBS' and CDO's.

Real estate prices continued to increase and the Fed's funds rate reached a low – in 2003 down to 1 percent. This resulted in euphoria in the US real estate market, as the public by now were treating houses as "commodities". More and more wanted a piece of the action and many of the new investors – first buyers – were subprime borrowers. This again contributed to the increase in real estate prices.

By this point in time, lenders introduced the so-called NINJA loans, which set aside almost every bit of documentation required on mortgage borrowers, especially subprime borrowers. This is a clear cut picture of the level of overtrading during this period of the SCC.

During the speculative frenzy concerned voices began to publicly question the sustainability and fragility of the development and point towards a state of irrational exuberance. However, the issue

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of timing plays a vital role in this regard and with all stacks against the concerned economists and experts at this point in time there was not much to do but let the course of events play out.

In early 2005 the first price decreases in real estate were observed in some states but it was not before mid 2006 that distress hit the real estate market, as prices were falling across America. As a result of the decreasing and stagnating real estate prices, financial institutions began to tighten their lending practices. Many subprime borrowers were by now facing the higher rates in their ARM's whilst simultaneously paying on a loan that is more worth than their house. Subsequently many subprime borrowers chose to default on their mortgage loans.

The concerned voices, that now included a broader spectrum of economists, investors and experts, found that the timing was right and expressed their warnings for the future to come. This contributed to the loss of confidence in the markets, as the "Originate and Distribute" strategy had spread the risk onto several markets and institutions that were holding the toxic assets.

A credit crunch emerged as financial institutions tightened their lending practices. This was also an issue amongst the institutions themselves as there resided great uncertainty of the level of losses and who carried great exposure – there still does. Bear Stearns was a major player that on the 18th of July 2007 announced that two of its hedge funds, that had invested heavily in subprime mortgage related assets, were not able to pay out to their investors due to the lack of assistance from other financial institutions.

The 9th of August 2007 was the day that changed the American economy. Ironically it was a French investment bank, BNP Paribas, which announced that it was not able to value assets in two of its hedge funds owing to a "complete evaporation of liquidity in the (subprime) market". This statement accentuated the problems in regards to the values on subprime related assets and finally led to the conclusion that they were worthless. A panic amongst financial institutions followed as these began to fear run on banks, thus the demand for high powered money increased dramatically. This led to the collapse of the ABCP market. Financial institutions were simultaneously cutting back on the lending to each other because it was insecure if they would ever get their loans back. Furthermore, financial institutions knew that trouble was ahead and the need for a comprehensive liquidity reserve could be crucial for their survival.

Banks experienced major losses through their SIV's as these entities were not eligible for Fed's assistance. This was also the case with the crash of Bear Stearns, which had two hedge funds holding extensive amounts of the toxic assets. However, the Fed estimated that the losses of letting

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this giant fall could become disastrous, thus funding J.P. Morgan Chase's acquisition of Bear Stearns.

The wreaking of havoc has since continued and the US market has seen the fall of several giants that have been let to fail, assisted via liquidity injection or taken over by a stronger bank or firm. Recently we experienced the fall of Lehman Brothers, former 4th biggest investment bank in the US and with a 158 year old history. Simultaneously, Merrill Lynch was acquired by Bank of America as it was feared that Merrill Lynch would soon had suffered the same faith as Lehman Brothers if let alone.

The level of systemic risk was visible when American International Group Inc. (AIG), a large US insurance company, immediately after the collapse of Lehman Brothers, received a downgrading by S&P and was on the brink of bankruptcy. It sought help amongst banks but none were willing to assist a falling giant. The Fed then decided to bailout AIG by injecting \$85 billion and removing the management.⁷⁵

The SCC is still ongoing and taking victims along its path. How the future for the American economy will play out is difficult to predict. However, the consequences till present time have been disastrous and there is even a discussion in the media on whether or not the US economy is in the state of a recession. However it might be we consider a recession to be highly probable in the near future to come as effects on the real economy have become a reality and the US economy is at current time experiencing a slow growth.⁷⁶ In regards to a depression following a recession, it is difficult to say at present time. If deflation becomes a reality and if the fall of other giants continues and the Fed in the long run, begins to draw the line on its funding and assistance then a depression is likely to follow a recession.

One thing is for sure today, the SCC is a financial crisis that will go into history as a major event. Alan Greenspan said about the SCC on ABC's "This Week":⁷⁷

"First of all, let's recognize that this is a once-in-a-half-century, probably once-in-a-century type of event..." Alan Greenspan, Live Interview on ABC's "This Week", 15th of September 2008

⁷⁵ Dash, Eric and Sorkin, Andrew Ross, "Throwing a Lifeline to a Troubled Giant", The New York Times, September 17, 2008

⁷⁶ Orszag, Peter R., "The Current Economic Situation", CBO Testimony before the Committee on the Budget U.S. House of Representatives, December 5, 2007

⁷⁷ <http://abcnews.go.com/Video/playerIndex?id=5798760>

7.3 *Micro Level*

The coverage of the SCC so far is characterized by mainly focusing on the macro level. In fact, there is little research done on elements from a micro level in the SCC, such as human behavior and investor psychology. Nonetheless, in order to obtain a thorough understanding of the current financial crisis it is not sufficient merely to focus on the macro level but rather important to also identify elements on the micro level. The better one understands the SCC the better off she will be at preventing a future crisis from occurring.

The core elements of the current extensive financial crisis originate in the subprime mortgage market. In order to dig deeper into the SCC it is of outmost importance, among other things, to analyze the behavior of the participants that constituted the problems in this market: subprime mortgage lenders (originators) and subprime borrowers. We have therefore chosen to analyze the behavior of these participants in following part of the analysis. We begin with the behavior of originators followed by the behavior of subprime borrowers.

It is important to emphasize that there exists numerous micro-elements, besides the selected elements, with importance to the greater understanding of the SCC, including the behavior of financial institutions and credit rating agencies. However, due to the limitations imposed upon us in this thesis, we are obliged to restrict ourselves from looking deeper into some of these elements.

7.3.1 The Behavior of Subprime Mortgage Lenders

Originators, as many other investors, saw an opportunity to gain substantial profits while the real estate bubble was on its way immediately after the burst of another bubble – the dotcom – and during a boom that was being financed by an expansion of credit. Prime borrowers were already in the race for profit because they already met the standard requirements in regards to raising home mortgage loans. The attention was thus turned towards subprime borrowers.

Originators have in the media been portrayed as the bad guys.⁷⁸ There is no doubt that these have contributed significantly to the cause of the SCC. However in order to understand the SCC thoroughly it is highly important to analyze the psychological elements behind this behavior and thus deviate from continuing to play the “blame game”.

⁷⁸ Vekshin, Alison, “Comptroller Says Abusive Loans Fueled Subprime Crisis”, Bloomberg, March 22, 2007

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Did originators act irrationally? There is not a clear cut answer to this question. In context to the state of the market, i.e. during the real estate bubble, we consider the answer to be no. This is so because of the fact that during the bubble there was a high demand for subprime loans and those in demand usually were imperfectly informed and irrational.⁷⁹ On the other hand, market participants, including originators, were victims of irrational exuberance in regards to the expectations of the real estate price development. The psychology of individual investors during a financial bubble is clearly affected by rising asset prices, in this case rising real estate prices. Investors tend to get overconfident in their investment decisions as the bubble grows and a belief of a “new era” occurs (De Bondt, 2003). De Bondt (2003, p. 206) refers to Keynes in this regard;

“There is nothing so dangerous as the pursuit of a rational investment policy in an irrational world.”

Originators have made substantial money during the real estate boom and did not see why they should jump off the train when apparently more money was to be made, even though concerned voices warned about the unsustainable level of real estate prices.⁸⁰⁸¹ This was a sign of overconfidence and greed among originators. They overestimated the future development of real estate prices and held an “optimistic” view on subprime borrowers’ ability to meet their future mortgage obligations.⁸² Furthermore, it is important to note that it is difficult to forecast when a bubble will burst – only possible with the benefit of hindsight (De Bondt, 2003, p. 205).

Overconfidence and irrational exuberance is one thing, fraudulent and culpable behavior is another. As aforementioned originators introduced liar loans and initiated the “Originate and Distribute” strategy in order to gain substantial profits. And they did, but on the cost of others.

Subprime liar loans were possible because of relaxed standards in the mortgage lending market. A quote from the Fed:

⁷⁹ The Law, Economics and Psychology of Subprime Mortgage Contracts, Oren Bar-Gill, Law School, The Berkeley Electronic Press, 2008, pp. 4-5

⁸⁰ “The US subprime crisis and the inevitability of bubble psychology”, Guest Editorials, Journal of Corporate Treasury Management, Vol. 1, 3 pp. 203-205, Henry Steward Publications, 2008

⁸¹ Schiller, Robert, “A Hedge for Your Home? Yale Economist Robert Schiller Talks Bubble Psychology”, CNN Money, September 20, 2004

⁸² Utkus, Stephen P., “Investor Psychology Leads to Bad Decisions”, On Wall Street, August 1, 2008

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“Moreover, an atmosphere of relaxed standards may increase the incidence of abusive lending practices by attracting less scrupulous originators into the market, while at the same time bringing more vulnerable borrowers into the market. These abuses can lead consumers to pay more for their loans than their risk profiles warrant.”⁸³

Originators wanted further market share and thus opened the opportunity for subprime borrowers with significantly weak credit scores, who normally could not afford to invest in real estate, to enter the market. These loans were then made complex with high reset costs. This was possible because of the bounded rationality of subprime borrowers who were not able to see through the different hidden fees and costs. Furthermore, subprime borrowers were willing to pay the high costs because they optimistically anticipated that they would be able to refinance their loan before it reset to a higher interest rate or simply sell the house at a premium and repay the entire loan.⁸⁴ In other words, subprime borrowers underestimated the consequences of the deferred costs. Fully aware of the creditworthiness and irrationality of subprime borrowers, originators went along and granted the liar loans in an effort to gain profits – no matter the consequences.⁸⁵

Originators are generally also lacking the incentives to do the right thing, i.e. not to lend to unstable borrowers, as they are commissioned salespeople with no vested interest in the performance of the originated subprime loans.⁸⁶ Furthermore, there is little repeat business in the subprime mortgage lending market as subprime borrowers take on a few mortgage loans during their lifetime and a relatively long period of time passes between the loans.⁸⁷ This contributed to the minimization of the incentives for originators to obtain a good reputation in regards to the abuse of subprime borrowers. Finally, the “Originate and Distribute” strategy allowed originators to distribute the underlying risk of the loans to high yield seeking investors in different markets and further contributed to the lack of incentives to follow the performance of the loans.⁸⁸ On the other hand, by

⁸³ http://www.federalreserve.gov/reportforms/formsreview/RegZ_20080109_ifr.pdf

⁸⁴ Bar-Gill, Oren, “The Law, Economics and Psychology of Subprime Mortgage Contracts”, Law School, The Berkeley Electronic Press, 2008, p. 2-4

⁸⁵ McGinn, Daniel, “Confessions of a Subprime Lender”, Newsweek, March 12 2008

⁸⁶ Shinkle, Kirk, “Inside the Subprime Debacle”, U.S. News, July 9, 2008

⁸⁷ Bar-Gill, Oren, “The Law, Economics and Psychology of Subprime Mortgage Contracts”, Law School, The Berkeley Electronic Press, 2008, p. 2-4

⁸⁸ “The US subprime crisis and the inevitability of bubble psychology”, Guest Editorials, Journal of Corporate Treasury Management, Vol. 1, 3 pp. 203-205, Henry Steward Publications, 2008

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moving the loans of their books, originators were able to lend even more aggressively to subprime borrowers.

Originators are relatively short lived.⁸⁹ The above mentioned strategy opened the possibility for new originators to enter the market for a quick buck with little existing reputation and insufficient incentives to create one.

7.3.2 The Behavior of Subprime Borrowers

As previously mentioned subprime borrowers entered the real estate market, on shaky grounds, in order to obtain a short term profit which they under normal market conditions would not have been able to receive. Subprime borrowers generally belong to the lower classes in society, are less educated and thus do not possess the prerequisites for perfect information on the rules of the game in the mortgage lending/financing market and of the economic trends in general. The lack of transparency in the subprime mortgage lending market and the complex structure of subprime loans further worsened the situation for this group of borrowers.⁹⁰

In an effort to simplify their borrowing decisions and as compensation for their bounded rationality, subprime borrowers adopted decision making heuristics.⁹¹ However, in some instances heuristics caused subprime borrowers to make bad mortgage borrowing decisions as a result of systematic errors in weighing risks and benefits.

In an effort to simplify their decisions in regards to the raising of a mortgage loan subprime borrowers isolated relevant measures such as interest rates throughout the entire mortgage loan and total amount of debt they were assuming and focused too much of their attention on monthly payments and initial low teaser rates.⁹² They set out a maximum amount they were willing and able to pay per month, often compared to amounts of prior mortgage- or rent payments, and would accept the first offer that was within their range instead of comparing costs among several providers and thus optimizing their choice of mortgage loan.⁹³ This behavior was caused by the pessimistic and myopic character of subprime borrowers. They were pessimistic about whether or not

⁸⁹ Civils, Worth and Gongloff, Mark, "Subprime Shakeout", The Wall Street Journal

⁹⁰ Staten, Michael E., and Yezer, Anthony M., "Subprime Lending: Empirical Studies", The Journal of Real Estate Finance and Economics, Volume 29, Number 4, December 2004, p. 361

⁹¹ McCoy, Patricia A., "A Behavioral Analysis of Predatory Lending", University of Connecticut, 2005, pp. 11-12

⁹² Surowiecki, James, "Subprime Homesick Blues" The New Yorker, April 9, 2007

⁹³ Willis, Lauren E., "Decision-making & the Limits of Disclosure: The Problem of Predatory Lending", Los Angeles, Loyola Law School, The Berkeley Electronic Press, 2005, p. 21

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originators would lend to them and myopic in regards to weighting short term gains to long term costs, i.e. subprime borrowers overvalued short term gains.⁹⁴

This was of much delight to originators who easily exploited these traits. An example hereof is the low teaser rates. Originators structured the subprime loans in such a way that the initial monthly payments were based on low teaser rates, thus providing subprime borrowers with loans that required monthly payments within their reach and tolerance. However, within a short period of time, say two years, the teaser rate would reset to a significantly higher interest rate and the monthly payments would in turn become unaffordable to subprime borrowers. Due to the myopia and overestimation of this group of borrowers they were not able to navigate and see through the hidden fees and deferred costs of subprime loans.

Kahneman and Tversky (1974) accentuated in *“Judgment under Uncertainty: Heuristics and Biases”* that individuals tend to overestimate the probability of compounded events:

“Biases in the evaluation of compound events are particularly significant in the context of planning. The successful completion of an undertaking, such as the development of a new product, typically has a conjunctive character: for the undertaking to succeed, each of a series of events must occur. Even when each of these events is very likely, the overall probability of success can be quite low if the number of events is large. The general tendency to overestimate the probability of conjunctive events leads to unwarranted optimism in the evaluation of the likelihood that a plan will succeed or that a project will be completed on time.” Kahneman and Tversky (1974, p. 1129)

Subprime borrowers usually raise mortgage loans with durations of thirty years. In order for the mortgage loans to be paid off successfully it is important that the monthly payments are met on time throughout the duration of the loan. Any small deviation from continuously making monthly payments on time can cause a default. Moreover, the longer the duration of the loan and the greater number of payments the higher the probability of default. Subprime borrowers were furthermore affected by the tendency of equating the probability of meeting the initial monthly payments with the probability of meeting the entire loan. This was dangerous because by underestimating the

⁹⁴ Surowiecki, James, “Subprime Homesick Blues” The New Yorker, April 9, 2007

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probability of default, subprime borrowers underestimated the probability of losing their homes. Nevertheless, this was the reality for many subprime borrowers during the SCC.

Over-optimism and the illusion of control likewise played a vital role in the decision making of subprime borrowers. When they raised the loan many subprime borrowers were of the opinion that they were able to meet their new obligation. Belonging to the lower classes in society, subprime borrowers knew that their initial income would not suffice but were of the opinion that they would be able to meet their monthly payments by cutting expenses and working overtime or getting a second job.⁹⁵ However, they do not control the supply of overtime or the availability of employment positions or more generally the condition of the economy themselves and therefore overestimated their abilities in this regard.

Some subprime borrowers were also characterized as acting greedily in their quest for short term profit.⁹⁶ The problem was that these borrowers did not have a sound investment strategy in advance and thus came to rely heavily on the information and (bad) loan offers from originators. Their initial strategy was to raise a loan within the maximum monthly payment they could afford, buy a house, keep the house for a short period of time, say one year, and then sell it at a premium. This strategy was erroneously based on the overly optimistic belief of the future price development of real estate and of the belief that one will be able to exit the market without incurring losses, i.e. exiting before price decreases occur.⁹⁷ As we have seen, price decreases finally occurred and many a subprime borrower did lose out on this strategy.

Moreover, empirical studies have shown that many home buyers tend to overestimate the correlation between past and future real estate price movements due to their bounded rationality.⁹⁸ This was also the case with subprime borrowers during the boom who extrapolated that “last years extraordinary real estate price increases” would continue throughout the following year and so forth – until price decreases became a reality.

⁹⁵ Willis, Lauren E., “Decision-making & the Limits of Disclosure: The Problem of Predatory Lending”, Los Angeles, Loyola Law School, The Berkeley Electronic Press, 2005, p. 39

⁹⁶ “The US subprime crisis and the inevitability of bubble psychology”, Guest Editorials, Journal of Corporate Treasury Management, Vol. 1, 3 pp. 203-205, Henry Steward Publications, 2008

⁹⁷ Utkus, Stephen P., “Investor Psychology Leads to Bad Decisions”, On Wall Street, August 1, 2008

⁹⁸ Bar-Gill, Oren, “The Law, Economics and Psychology of Subprime Mortgage Contracts”, Law School, The Berkeley Electronic Press, 2008, p. 25

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Emotions did also play a vital role in the decision making of subprime borrowers.⁹⁹ For instance, as pointed out earlier the majority of subprime borrowers were usually of a lower social status and with lower incomes. By entering the real estate market many believed that they would make money and create a safety net for their family, e.g. higher education for the youngsters, thus climbing up the latter of society. With this in mind and the fear of a denial for a mortgage loan, due to the fragility of their financial situation, these borrowers were quick to accept the first loan they initially could “afford” – i.e. until the teaser rates reset – regardless of the total cost of the loan. This again put the originators in a favorable position:

“The marketing campaigns of subprime lenders play on these emotional coping mechanisms, emphasizing “the power of yes” and the guarantee of approval, without advertising the interest rate or annual percentage rate of the loans being offered.”¹⁰⁰

This leads us to the element of framing. In a sound setup, borrowers are generally likely to focus much of their attention to the interest rate as this is the determinant of the price of the loan. However, by framing “the power of yes” in the above example originators succeeded in moving the attention away from the true costs of the loan.

As aforementioned, during the real estate boom subprime borrowers were generally operating with a short term perspective. This was dangerous because it invoked bad decisions due to impatience and high market volatility. When prices went down, the foreclosure rate increased. This was a reaction of loss-aversion among subprime borrowers, because they were not willing to take the loss when the value of their home fell below the value of their loan. In fact, loss aversion was a reality amongst investors in general. In order to stabilize the situation economists have accentuated the necessity of reframing:

“In periods of declining markets and loss aversion, it’s about reframing investors’ perceptions to the bigger picture, (...) putting portfolio losses in an historic context.”¹⁰¹

⁹⁹ “Emotion’s Role in Investment”, The Financial Times, September 25, 2007

¹⁰⁰ Willis, Lauren E., “Decision-making & the Limits of Disclosure: The Problem of Predatory Lending”, Los Angeles, Loyola Law School, The Berkeley Electronic Press, 2005, p. 24

¹⁰¹ Utkus, Stephen P., “Investor Psychology Leads to Bad Decisions”, On Wall Street, August 1, 2008

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Thus, by reframing people's perspectives from short to long term, stability might have been achieved because people would not worry about their losses to the same degree.

7.3.3 Sub Conclusion

Originators acted rationally in context to market conditions during the real estate bubble where the demand for subprime loans was high and subprime borrowers usually were imperfectly informed and irrational. However, the behavior of originators in regards to their expectations of the future real estate price development and the belief of a new era is characterized as irrational.

Overconfidence and greed came to light as originators obtained extraordinary profits even though economists and experts began to question the sustainability of the real estate price level. Fraudulent and culpable behavior is based on the "Originate and Distribute" strategy and the lax lending standards, i.e. liar loans, which further provided substantial profit for originators on behalf of others. Originators were aware of the unstable financial situation of subprime borrowers but continued nonetheless to grant them mortgage loans in an effort of gaining profit no matter the consequences.

The "Originate and Distribute" strategy posed another setback as the underlying risk was distributed to other investors, thus minimizing the incentives for originators to follow the performance of the loans and enabling them to lend more aggressively to subprime borrowers. As there is little repeat business in the subprime mortgage lending market originators were less likely not to 'abuse' subprime borrowers in order to obtain a good reputation. It was all about the selling.

The behavior of subprime borrowers was influenced by their bounded rationality. In an effort of simplifying their investment decisions they isolated important measures such as the interest rate and the total amount of debt on the loan and focused too much of their attention on the monthly payments and initial low teaser rates. Making a payment with a very low interest rate today is not the same as being able to meet the entire loan when interest rates fluctuate over say 30 years. Furthermore, the pessimistic character of subprime borrowers restricted them from shopping around for the cheapest loan and the myopic character made them overvalue short term gains. This stimulated originators to offer complex loans with hidden fees.

7.4 *The Lender of Last Resort*

In this last section of the analysis we will delve into the issue of the Federal Reserve (Fed) as the lender of last resort to the financial markets in the U.S. This analysis will be based on the actual responses of the Fed which will then be discussed on the basis of the theory on the LOLR.

7.4.1 The Federal Reserve System

Prior to the formation of the Fed in 1913 The USA had a financial system that can be characterized as being closest to free banking. No central bank was present and as the US markets were ravaged by various financial crises during the nineteenth and beginning of the twentieth century the country was plagued by several banking failures. The National Monetary Commission was set up in 1907 in an effort to put an end to these failures. The lobbying of the commission for an independent central bank finally led to the passing of the Federal Reserve Act on 23 December 1913. This act resulted in the establishment of central banks throughout the country with the overall objective of providing short term liquidity funding so as to prevent bank runs. Today the official purpose of the Fed is four pronged:¹⁰²

1. Ensuring maximum stability, stable prices and moderate long term interest rates. This is done by the effect that the monetary policy of the Fed has on the money and credit situation within the country.
2. Supervision and regulation of banks.
3. Protecting the stability of the financial system and containing the systemic risk that may arise in times of financial distress.
4. Financial services to miscellaneous institutions and the US government.

From our vantage point it is off course the obligation to maintain financial stability and contain systemic risk that is of interest when talking about the role of the Fed as the LOLR. In the following we will describe the traditional tools which have traditionally been used by the Fed with these objectives in mind.

¹⁰² http://www.federalreserve.gov/pf/pdf/pf_complete.pdf

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7.4.2 Policy Tools

The Fed can affect the economy in an indirect but never the less substantial way. This is done by the tools available to the Fed. The challenge of the Fed is however to support the real economy and not undermine it via its monetary policy. An important aspect in this regard is to ensure an appropriate amount of money at all times whilst dodging the risk of rising inflation.¹⁰³

The first and foremost tool available to the Fed is the Federal Open Market Committee (FOMC). Via the use of this facility the Fed indirectly affects the federal funds rate. The federal funds rate is the rate that banks and other depository institutions pay for the overnight borrowing of money from other banks. As the assets and liabilities of banks are continually in transition and since all banks are required to fulfill a minimum capital requirement, the demand for cash is also continually changing. If banks then need additional cash, this can be achieved through the federal funds market through short term loans. The loans are granted from banks with surplus liquidity to banks in need of cash. It should be needless to say that the rate on these short term loans is determined on the basis of the amount of liquidity in the market. The amount of liquidity can be determined by the Fed through the FOMC where the Fed either sells or buys government securities. If the situation calls for a reduction of the federal funds rate the Fed will buy government securities from banks thus injecting liquidity into the market which in turn will lower the price of money in the interbank lending market (federal funds market). The reverse is the case if the desired circumstance is a raise in the federal fund rate (interbank lending rate).¹⁰⁴ These procedures have an indirect effect on the economy as a whole. While an increase in the federal fund rate reduces money supply and therefore inflation the opposite encourages greater economic growth.¹⁰⁵

A second tool that is relevant for the Fed as a lender of last resort is the discount window lending that is offered to qualified banks. This is a tool that mostly becomes relevant in times of financial distress.¹⁰⁶ The discount rate is off course the rate on these loans. Since January 2003 the discount rate has been 100 basis points above the federal funds rate target. This is fully in the spirit of the teachings of Bagehot and is done in order to discourage all but the neediest banks from resorting to this solution.¹⁰⁷ In essence the rate is a penalty rate in accordance with the traditional theory of the

¹⁰³ <http://www.america.gov/st/econ-english/2008/April/20080416162233attocnich0.3449518.html>

¹⁰⁴ <http://www.frbsf.org/publications/federalreserve/monetary/tools.html>

¹⁰⁵ <http://www.america.gov/st/econ-english/2008/April/20080416162233attocnich0.3449518.html>

¹⁰⁶ <http://www.america.gov/st/econ-english/2008/April/20080416162233attocnich0.3449518.html>

¹⁰⁷ <http://www.frbsf.org/publications/federalreserve/monetary/tools.html>

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LOLR. Furthermore the borrowing bank must also show that it has sufficient collateral to receive funds.

We will in following chapters see how the Fed has implemented its tools in response to the challenges brought on by the SCC.

7.4.3 Lender of Last Resort Responses

The following chapter on the responses of the Fed is divided into two parts in order to provide a logical overview. The first part will entail an analysis of the macro-level responses aimed at assisting the overall market. Hereafter will follow an analysis of the assistance offered by the Fed to individual firms.

7.4.3.1 Market Responses

Immediately after the outbreak of the SCC in August 2007 the effects of the crisis in the financial markets became obvious. A definite sign of distress in the markets can be pinpointed in the freezing up of the interbank lending market. For several reasons banks began to hoard cash and thus were unwilling to lend. Two reasons are blamed for the deficiency of the markets. Firstly the difficulties related to the subprime defaults brought with it a perceived increase in credit risk. The dramatic increase in home loan defaults is the catalyst in this relation. As losses mounted surely financial institutions perceived it as a sign that the risks on their assets were higher than initially thought.

A second reason for the freezing up of the interbank lending market may be the reluctance to lend due to the uncertainties as to the values of their own balance sheets. As assets became harder to value there was doubt as to the capital requirement that had to be kept at stock. To be on the safe side banks' became reluctant to lend out of the funds that were already in stock.¹⁰⁸ In essence what happened was that the effects of the crisis, psychological as well as financial, distorted the efficiency of the interbank lending market and thus manifested itself in a credit crunch.

¹⁰⁸ http://www.newyorkfed.org/research/current_issues/ci14-5/ci14-5.html

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As commercial banks to a large degree rely on short term funding and therefore need continued access to funds from the interbank market the freezing up of the market constituted a serious problem for the economy as a whole.¹⁰⁹

Liquidity strains also caused more serious problems in areas other than the commercial banking industry. Since much of US mortgage finance today flows through other financial institutions than banks and the fact that many of these institutions operate in a similar fashion as banks (borrowing short and lending long) added to the graveness of the situation. As these institutions are dependent upon funding from the interbank market, the liquidity strain imposed a whole new set of challenges for the Fed.¹¹⁰

As events unfolded and time passed the Fed felt obliged to address the problems in the financial markets by conventional as well as unconventional methods. In the following we shall retrace important steps employed as assistance to the overall financial markets.

7.4.3.1.1 Open Market Operations

The manipulation of the federal funds rate by liquidity injections has traditionally been the instrument of choice when conducting monetary policy on a macro-level. In keeping with this the next few months saw a series of aggressive maneuvers initiated by the Fed. Following seven consecutive cuts in the federal funds rate (interbank lending rate) there was a total accumulated decrease of 3.25 percent in the rate.¹¹¹

Table 1

Cuts in the Target Federal Funds Rate and Primary Lending Rate	
September 1, 2007	50 basis point cut at regularly scheduled FOMC meeting
October 21, 2007	25 basis point cut at regularly scheduled FOMC meeting
December 11, 2007	25 basis point cut at regularly scheduled FOMC meeting
January 21, 2008	75 basis point cut at an unscheduled FOMC meeting
January 30, 2008	50 basis point cut at regularly scheduled FOMC meeting
March 18, 2008	75 basis point cut at regularly scheduled FOMC meeting
April 30, 2008	25 basis point cut at regularly scheduled FOMC meeting

Source: The Federal Reserve

¹⁰⁹ Crisis and Responses: The Federal Reserve and the Financial Crisis of 2007-2008, p. 6

¹¹⁰ Maintaining Stability in a Changing Financial System: Some Lessons Relearned Again, p. 10

¹¹¹ Crisis and Responses: The Federal Reserve and the Financial Crisis of 2007-2008, p. 12

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In addition to these instruments minor changes were also implemented. These include the prolonging of term windows and the arrangement of extraordinary meetings at the FOMC with the purpose of conducting further open market operations.¹¹²

Where these instruments have proven their worth in the past, they proved to be painfully inadequate in this case. The discount window lending facility was not taken advantage of as much as the Fed would have liked and as a result things did not improve.

A reason for this reluctance to borrow might be the fact that banks have been reluctant to borrow in the past. The stigma connected to discount window borrowing and the negative signals it purveys as to the financial condition of the banks have traditionally been important factors in this regard.¹¹³

What was apparent from these inefficiencies was that the liquidity strains in the financial markets had to be addressed by the Fed which answered by evolving a new facility.

7.4.3.1.1.1 Term Auction Facility

In December 2007¹¹⁴ the Term Auction Facility (TAF) was created in an effort to improve overall market liquidity partly by distributing funds to banks that really needed them and partly by removing the stigma associated with discount borrowing.¹¹⁵

As is apparent from the name this facility is in effect an auction of a predetermined pool of cash. The distribution is carried out via this anonymous auction where all depository institutions have the option to bid on amount and rate of the loan they desire which is done without the mediation of the traditional primary dealers. The optimal bids are then accepted by the Fed. Thus the facility lets the market determine the rate on funds instead of trying to predetermine the target federal funds rate. The loans are furthermore supported by adequate collateral which ensures the solvent status of loan takers.¹¹⁶

The facility in actuality has characteristics of both open market operations and discount window lending hence it represents a combination of the macro and micro dimension wherein the LOLR operates. The competitive auction format of the fixed funds and the market determined rate are important factors in its classification as a macro economic policy move. The collateralized nature of

¹¹² http://www.federalreserve.gov/boarddocs/hh/2008/july/0708mpr_part1.htm

¹¹³ Crisis and Responses: The Federal Reserve and the Financial Crisis of 2007-2008, p. 4

¹¹⁴ <http://www.federalreserve.gov/newsevents/press/monetary/20071212a.htm>

¹¹⁵ Crisis and Responses: The Federal Reserve and the Financial Crisis of 2007-2008, p. 14

¹¹⁶ <http://www.federalreserve.gov/monetarypolicy/taf.htm>

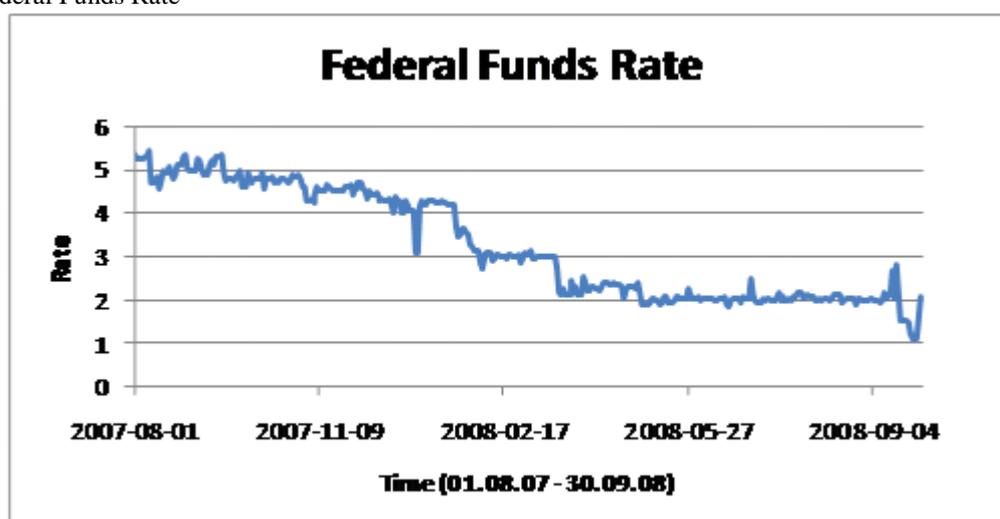
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the funds however resembles discount window lending.¹¹⁷ The facility further differentiates itself from the traditional notion of monetary policy by the longer terms on the loans which can be 28 or 35 days.¹¹⁸

As the FOMC auctions off liquidity directly to depository banks by bypassing the 19 primary dealers¹¹⁹ and furthermore provide anonymity to the borrowing banks, this facility proved to be more successful than the traditional open market operations.¹²⁰

This vehicle thus seems to have provided a more stable flow of funds and a decrease in the cost of money. Since then the federal funds rate has continued its slope on and off. This is also apparent in figure 8 below:

Figure 8: Federal Funds Rate



Source: The Federal Reserve

It is obvious to observe from figure (that since the outbreak of the subprime crisis in August of 2007 there has been a remarkable decrease in the level of the federal funds rate. Beginning at a level above 5 per cent it has entered a steep descent to a level of around 2 per cent.

Aiming at keeping the banking community liquid, the Fed attempted, instead of open market operations, to allay any impending financial threats by providing much high powered money thus

¹¹⁷ http://www.newyorkfed.org/research/current_issues/ci14-5/ci14-5.html

¹¹⁸ http://www.newyorkfed.org/research/current_issues/ci14-5/ci14-5.html

¹¹⁹ http://www.newyorkfed.org/research/current_issues/ci14-5/ci14-5.html

¹²⁰ http://www.federalreserve.gov/boarddocs/hh/2008/july/0708mpr_part2.htm

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following the classical view. These were not exactly provided via open market operations but in a hybrid form between open market operations and discount window lending.

The money view on the LOLR advocate LOLR response solely by open market operation as it is not clear that the Fed can offer individual aid to banks cheaper than the private sector. The big issue here is however the freezing up of the interbank lending market. The reluctance of banks to lend to each other and the scarcity of money must be considered as prime reasons for the inefficiency of this view and disregard of it in this specific case.

Where this facility seems to have improved overall conditions with regard to the distribution of funds in capital markets it has however not addressed all the issues that have had an impact on the economy.

7.4.3.1.2 Term Securities Lending Facility

The TAF aimed at improving overall liquidity conditions of depository institutions it did however not address the underlying uncertainties connected to the securities market. Spurred on by the recent defaults on MBS' investors lost confidence in the market for these securities and in effect entered a flight to quality by preferring the more secure and liquid securities issued by the US treasury. Consequently risk spread between these securities began to widen.

This was a clear indication of the problems on the marketplace and the main reason for the freezing up of the market for collateralized securities. As securities became harder to sell and thus to value, the circle became self enforcing.¹²¹

In March 2008 the Fed announced the creation of yet another facility. Where the TAF was aimed at addressing urgent liquidity needs, the Term Securities Lending Facility (TSLF) was intended as a tool for reviving the financial markets and especially the market for collateralized securities. The aim was therefore to reduce the spread between these securities and those of the Treasury and thus make the credit markets feel more comfortable in buying mortgage bonds again.¹²²

In essence the TSLF is comprised of a trade between assets. Hard to move securities are taken as collateral through this facility in exchange for the much more liquid securities of the Treasury. The offer was extended to the primary dealers of the Fed. Being some of the largest investment banks in

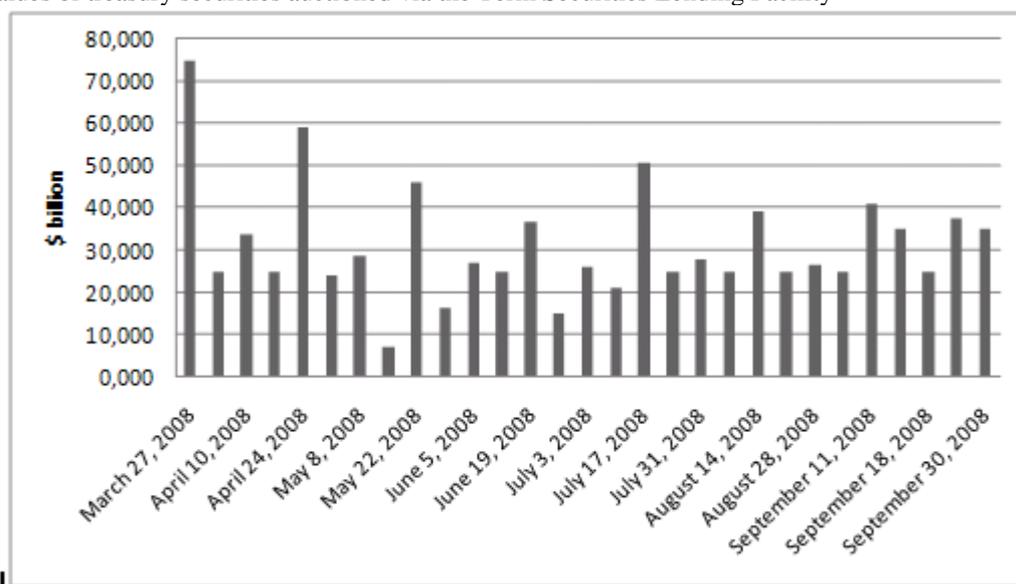
¹²¹ Crisis and Responses: The Federal Reserve and the Financial Crisis of 2007-2008, p. 16

¹²² <http://federalreserve.gov/newsevents/press/monetary/20080311a.htm>

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the world these institutions had in their possession vast amounts of the problem stricken securities. With the Fed's announcement to lend up to \$200 billion to primary dealers for a term of 28 days in March alone, these institutions had the opportunity to receive treasury notes that are as good as cash in exchange for a pledge of other securities. These securities include federal agency debt, federal agency residential MBS, and non-agency AAA/Aaa-rated private-label residential MBS. The distribution of securities to the primary dealers is also auction based as is the case with the TAF.¹²³

Figure 9: Values of treasury securities auctioned via the Term Securities Lending Facility



Source: The New York Federal Reserve

A peculiar and so far unheard of aspect of the facility is however the fact that it was extended to the primary dealers of the Fed thus allowing access to the facility for non-depository institutions such as the big investment banks. As non-depository institutions these institutions are outside the regulatory and supervisory purview of the Fed. This makes it the first time such a move has been made since the 1930's.¹²⁴ The new program offers the big investment banks the same kind of access to cheap one month loans the Fed has been offering to depository institutions through the TAF. By establishing this facility the Fed in effect is trying to ameliorate the consequences of the credit squeeze by attacking the root of the problem which is the mortgage bonds. As the market for these bonds dried up and Wall Street firms felt compelled to sell at fire sale prices the situation would

¹²³ <http://federalreserve.gov/newsevents/press/monetary/20080311a.htm>

¹²⁴ The Subprime Solution, p. 90

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continue to worsen unless measures were implemented. With this facility these mortgage backed bonds are accepted for treasury securities that are as good as money thus improving liquidity in the financial markets and reassuring markets as to the liquidity of those securities.¹²⁵

The TSLF is a distinct testimony as to the ingenuity of the Fed in dealing with the SCC. Several issues are to be highlighted in this matter however. One is the inclusion of non-depository institutions into the federal safety net normally preserved for depository institutions. A second issue is the Fed's disregard as to the disadvantages of this assistance as there is no doubt that the mortgage bonds that are accepted as collateral are markedly riskier than the Fed's traditional mix of securities ultimately resulting in a gamble with tax payer money.

In a statement by Fed officials these drawbacks to the plan were never the less given a lower priority as the unfortunate consequences of the actions couldn't even be compared to the implications if the mortgage markets were not stabilized. This stabilization has however not occurred as risk spreads only declined somewhat in the months to follow and remained much higher than usual.¹²⁶

The classical view is again the guiding star for the Fed with the creation of the TSLF. Recognizing the financial implications for the whole financial market in the event of a collapse in the market for mortgage bonds the Fed stepped in and took action by providing liquidity to the primary dealers and thus preventing a fire sale. There is however a worrying disregard of the scriptures of Walter Bagehot in the relaxation in the definition of what constitutes good collateral.

7.4.3.1.3 Primary Dealer Credit Facility

Following the demise and subsequent LOLR response to Bear Stearns, which will be reviewed upon in chapters to come, the Fed initiated another milestone facility. On March 16, 2008 the Primary Dealer Credit Facility was initiated as the means to bolster the financial standing of the primary dealers of the Fed.¹²⁷

¹²⁵ Andrews, Edmund L., "Fed Assumes The Role of Lender of Last Resort", International Herald Tribune, March 12, 2008

¹²⁶ Andrews, Edmund L., "Fed Assumes The Role of Lender of Last Resort", International Herald Tribune, March 12, 2008

¹²⁷ <http://www.federalreserve.gov/newsevents/press/monetary/20080316a.htm>

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The Primary-Dealer Credit Facility (PDCF) was designed as a facility that in effect provided the primary dealers with anonymous discount-window lending like the discount window lending that has for a long time been offered to depository institutions. Likewise the rates on these overnight loans are equal to the primary credit rate for traditional discount window lending.¹²⁸

Via this facility the Fed assured short term funding for investment banks in exchange for collateral that include investment grade MBS'.¹²⁹

The facility which was initially intended to last for a period of minimum six months was later extended to at least January 2009.¹³⁰

As was the case with the TSLF what we in effect see here is the Fed bending the rules for normal LOLR actions by extending the federal safety net to institutions outside regulatory and supervisory purview thus making use of the broadest scope of its lending authorities since the 1930's.¹³¹

Although, in effect this is an extension of discount window lending to the primary lenders in the spirit of the classical view, at the same time we observe yet again that the accepted collateral is not the best in its class.

7.4.3.1.4 The \$700 Billion Bailout

On the backdrop of the failures of several large financial institutions in September 2007 the biggest bailout plan ever devised was introduced for approval by congress.

This plan entails the possibility that the US government may purchase up to \$700 billion in bad mortgage related securities and other devalued assets from troubled financial institutions over the next two years. The purchases of the problem stricken securities will be done from any financial institution, depository as well as non-depository, headquartered in the US.¹³² The overall aim of this initiative is to get the credit markets flowing again and thus to prevent a recession.¹³³

The plan was conceived following a week of hectic activity in the financial markets as two of America's premier investment banks went under. Merrill Lynch succeeded in finding a suitable

¹²⁸ <http://www.federalreserve.gov/newsevents/press/monetary/20080316a.htm>

¹²⁹ <http://www.thenewstribune.com/business/story/320209.html>

¹³⁰ http://www.newyorkfed.org/markets/pdcf_faq.html

¹³¹ Aversa, Jeannine, "Fed Lending Program Popular", The News Tribune, March 28, 2008

¹³² Dobbyn, Tim and Drawbaugh, Kevin, "Congress examines \$700 billion market bailout plan", Reuters, September 20, 2008

¹³³ Stout, David, "The Wall Street Bailout Plan, Explained" New York Times, September 20, 2008

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buyer as a source for potential whilst Lehman was allowed to fail. In the wake of this failure AIG was hit hard and ultimately received LOLR assistance despite its role as a financial insurance company.¹³⁴

Henry Paulson the secretary of the treasury commented on the plan, saying:

*"We must now take further, decisive action to fundamentally and comprehensively address the root cause of our financial system's stresses. The federal government must implement a program to remove these illiquid assets that are weighing down our financial institutions and threatening our economy."*¹³⁵

It is a fact that the securities that will eventually be purchased by the Fed under this plan are inherently riskier than the traditional securities of the Fed. Therefore the plan is actually a gamble with tax payer funds, a gamble that very well might result in a loss of tax payer money. President Bush however accentuated the risks of a loss of confidence in the financial system as being far worse than the risk they are running by instituting this program and reassured the public that they would get their money back:

*"People are beginning to doubt our system, people were losing confidence and I understand it's important to have confidence in our financial system."*¹³⁶

This bailout plan represents a crucial milestone in the workings of the Fed. In an attempt to rescue the entire financial system all bets are off. In exchange for high powered money the Fed receives what is, at best suspicious securities that very well might entail a loss for the Fed and thus the public. Despite the big issue of bad collateral the classical view fits best this response.

¹³⁴Dobbyn, Tim and Drawbaugh, Kevin, "Congress examines \$700 billion market bailout plan", Reuters, September 20, 2008

¹³⁵ Financial Times Reporters, "Proposed Wall Street bailout to cost \$700bn", The Financial Times, September 21, 2008

¹³⁶ Financial Times Reporters, "Proposed Wall Street bailout to cost \$700bn", The Financial Times, September 21, 2008

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7.4.3.2 Sub Conclusion

What is evident from preceding chapters is that the Fed has made a real effort to evolve as new facets to the SCC have revealed themselves. Starting with liquidity injections other methods have also been taken into use. The TAF was intended to solve the freezing up of the credit market and removing the stigma associated with discount window lending whereas the TSLF targeted the flight to quality in the securities markets. It was believed that this initiative would calm investors down and ensure the continued liquidity of these securities thus restricting the fire sale and continued devaluation of these assets. A point that deserves special attention with regards to this facility is however the inclusion of the primary dealers under the wings of the federal safety net thereby realizing the biggest extension of the responsibilities of the Fed since the 1930's.

Following the demise of Bear Sterns in mid march the PDCF took this move to another level as the primary dealers now were granted the same access to discount window lending and under the same terms as traditional depository institutions. These initiatives represent a whole new set of issues for the Fed as a LOLR because thoughts now undoubtedly go to the classic problematic issue of moral hazard that now includes institutions outside the regulatory and supervisory purview of the Fed. With the new plans of the biggest bailout in history this norm is continued as the purchase of securities is done via all financial institutions headquartered in the US thus not distinguishing between depository and non-depository institutions.

The useless nature of the open market operations made useless also the money view as this method was the only one advised. The functioning of the interbank lending market is a prerequisite for the efficiency of this view, which was obviously not the case. The classical view however is more adhered to. The Fed has shown its commitment to sustain the integrity of money markets even if it entails a lowering of standards on the question of what constitutes good collateral. Among other things the Bagehotian principles state that LOLR operations should be based on good collateral. This is however not the case in several of the responses we have seen so far. The TSLF and the \$700 billion bailout are prime examples in this regard. In the case of the TSLF, treasury securities, which are as good as money, are given away in exchange for securities of obviously poorer quality and for which there exists no ready market. In essence the \$700 billion bailout represents the same problem as the only difference is that the plan entails purchase of all the problem stricken bonds in exchange for cash.

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7.4.3.3 Individual Assistance

The SCC has amassed a massive death toll among financial institutions and recently the death tolls have begun to accelerate. These events have been deemed so damaging to the financial markets that they have even spurred on actions from the Fed. In what follows we shall provide an analysis of the most important LOLR actions provided to individual financial institutions.

7.4.3.3.1 Bear Stearns

In mid march of this year the financial markets were devastated at the news of the collapse of Bear Stearns. The company which was one of the big five financial brokers in the US had after the outbreak of the crisis in August of last year been witness to the demise of two internal hedge funds which constituted the proverbial SIV's. Beginning with these initial signs of weakness the value of the stock plummeted 79 per cent in the months to follow.¹³⁷

As the word got out that the brokerage firm might be in financial distress this precipitated a run on the bank as anxious clients pulled out their money and other financial institutions refused to conduct business with Bear Stearns. Alan Schwartz, the chief executive director of Bear Stearns in a conference call with analysts said:

*“A lot of people wanted to get cash out.”*¹³⁸

As Bear Stearns like all securities firms relied on a continued flow of liquidity the run on the company spelt trouble and it was forced to seek additional liquidity. Following several attempts that fizzled out, Bear Stearns was compelled to turn to the Fed in search of assistance.¹³⁹

Where the Fed in the past had been reluctant to bail out companies that had not been under the federal safety net, as was the case with LTCM and Drexel Burnham Lambert Inc., the decision was however in this case to intervene.¹⁴⁰

The intervention in the case of Bear Stearns came first as a 28 day loan that was extended via a middle man in the form J.P. Morgan Chase. As this was prior to the foundation of the PDCF

¹³⁷ Hamilton, Walter and Petruno, Tom, “Wall Street giant gets Fed bailout” Los Angeles Times, March 15, 2008

¹³⁸ <http://articles.latimes.com/2008/mar/15/business/fi-bear15>

¹³⁹ <http://online.wsj.com/article/SB121184521826521301.html>

¹⁴⁰ <http://online.wsj.com/article/SB121184521826521301.html>

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investment banks did not have access to the lending mechanism of the Fed. J.P. Morgan Chase on the other hand did have access thanks to its bank subsidiary. Thus J.P. Morgan Chase extended the loan to Bear Stearns while it was the Fed that bore the risk of the loan.

This however did not ameliorate the situation and things went from bad to worse and investors fled the seemingly sinking ship. Bear Stearns collapsed while it was making money and had, theoretically at least, a sound balance sheet. Its former leaders still complain that short selling hedge funds spread false rumors to bring their institution down. Asymmetric information may also have played a role as lenders were in doubt as to the solvency of the company.¹⁴¹ Coming to grips with the situation Bear Stearns accepted a takeover bid from J.P. Morgan Chase at \$2 dollars a share. The bid was initially higher but was lowered at the encouragement of Treasury secretary Henry Paulson as a future safety measure against future moral hazard by in effect penalizing the Bear Stearns for all to see.¹⁴²

According to the agreement with J.P. Morgan Chase the Fed would assume responsibility for \$30 billion dollars in hard to trade securities on Bear Sterns books regardless if they result in a loss or a profit. In effect the Fed is taking a gamble by purchasing risky assets on the behalf of taxpayers thus in actuality behaving like a hedge fund or investment bank itself.¹⁴³

The widening of the lending authority is a norm that has also found its way into the LOLR responses for individual institutions. With the bailout of Bear Sterns the Fed has passed another key milestone by providing individual assistance to an institution outside the federal safety net.

Despite the obvious moral hazard implications for the financial markets as a whole Ben Bernanke defended the response on account of the damages to market confidence that otherwise would have occurred. In a statement he said:

*"The damage caused by a default by Bear Stearns could have been severe and extremely difficult to contain"*¹⁴⁴

¹⁴¹ http://www.ft.com/cms/s/0/e42d445e-62a0-11dd-8ed5-000077b07658.html?nclick_check=1

¹⁴² <http://online.wsj.com/article/SB121202057232127889.html?mod=article-outset-box>

¹⁴³ Kelly, Kate, "Fear, Rumors Touched Off Fatal Run on Bear Stearns", The Wall Street Journal, May 28, 2008

¹⁴⁴ Kirschhoff, Sue, "Fed Chief Bernanke Defends Bear Stearns Deal" USA Today, April 2, 2008

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Committee Chairman Christopher Dodd concurred with this opinion and added that a bailout of Bear Stearns was necessary due to the risk to the whole financial system if a large institution were to fail.¹⁴⁵

How indirectly it may be, the fact of the matter is that the J.P. Morgan Chase takeover of Bear Stearns was in fact a bailout sponsored by the Fed. If we look away from the fact that Bear Stearns was an investment bank, and as such is not entitled to LOLR assistance the solvent but illiquid status at the time of its takeover would justify LOLR assistance according to the Classical view on the LOLR. We observed here that once again the Fed showing disregard for the recommendations of Bagehot and company by assuming responsibility for a large chunk of Bear Stearns securities. The argument for this was the preservation of the integrity of financial markets.

7.4.3.3.2 Fannie Mae & Freddie Mac

As it was stressed in earlier chapters the SCC has so far claimed more than its fair share of casualties among financial institutions. The big government sponsored enterprises of Fannie Mae and Freddie Mac would surely have taken their place among these failed companies had it not been for the Fed.

Under the plan the two companies are put under so-called conservatorship. The Federal Housing Finance Agency will take over the reins whilst replacing the management teams at the companies. The vulnerable financial standings of both companies will at the same time try to be mended with the purchase of up to a \$100 billion of a special class of securities in each company so as to keep the companies solvent (Freddie Mac had purportedly taken on debt worth \$5.2 billion more than the fair value of its shares, effectively making it insolvent).¹⁴⁶ With a bailout representing so much of tax payer funds this rescue is the biggest individual company initiative in the SCC so far.

With the great importance these two companies have for the home mortgage sector, considering their 50 per cent stake in the financing sector it is hardly any wonder that the mortgage market would have been shaken by the fall of these giants. This is emphasized in a statement by former Federal Reserve Bank of St. Louis President, William Poole:

¹⁴⁵Kirschhoff, Sue, "Fed Chief Bernanke Defends Bear Stearns Deal" USA Today, April 2, 2008

¹⁴⁶Politi, James et al., "Freddie Mac and Fannie Mae in Turmoil", The Financial Times, July 11, 2008

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“Officials are aiming to prevent the mortgage market from falling apart.”¹⁴⁷

The Banking view put forth first and foremost by Charles Goodhart suits the case of Fannie Mae and Freddie Mac perfectly. Here we observed two large companies that had become illiquid as well as insolvent but whose demise would have destroyed confidence in the entire financial system. This again would have led to further contagion and a worsening of the already grim situation. This is recognized by the Fed in its bailout of the two companies. Unfortunately however the moral hazard implications are bigger yet when adhering to the Banking view.

7.4.3.3 Lehman Brothers & American International Group

In September Lehman Brothers became the second big American investment bank to fail. In this case however the Fed did not extend a helping hand. By allowing Lehman Brothers to fail the Fed made an important statement showing its reluctance to bail out illiquid and insolvent financial institutions at the expense of tax payers.¹⁴⁸ If market stability could be maintained big and important banks would be allowed to fail.¹⁴⁹

September was truly a disastrous and hectic month for officials at the Fed. Following the LOLR assistance to Fannie Mae and Freddie Mac and the denial of the same privilege to Lehman Brothers suddenly the Fed faced a dilemma as one of the big players in the financial markets faced failure. One of the biggest insurance companies in the world, American International Group (AIG) was in financial distress. The company which employed 116,000 people worldwide was badly affected by the collapse of the market for mortgage securities. As the number of home mortgage defaults increased, so did the obligations that AIG had in the form of underwriting payments bringing the company to the brink of failure.¹⁵⁰

Having made an example of its reluctance to support the financial sector in the case of Lehman Brothers the Fed however went into action as the situation of AIG went from bad to worse. The

¹⁴⁷ Christie, Rebecca and Kopecki, Dawn, “Paulson Engineers U.S. Takeover of Fannie, Freddie”, Bloomberg, September 7, 2008

¹⁴⁸ Roubini, Nouriel, “The Shadow Banking System is Unraveling”, The Financial Times, September 21, 2008

¹⁴⁹ “Changing the Rules of the Game”, The Financial Times, September 17, 2008

¹⁵⁰ “US Government rescues insurer AIG”, BBC, September 17, 2008

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shares of AIG had recently suffered a great fall in share prices as the value of these fell 21 per cent thus bringing the value of the company's market capitalization down to a meager \$7.5 billion, a low value for the biggest insurance company in the US.¹⁵¹ This chain of events resulted in the illiquidity and most likely also insolvency of the company.¹⁵²

Following a series of hectic meetings at the New York Fed the reluctance of the Fed to bail out any more financial institutions was reversed and a bail out plan was hastily put together.

This plan, which has been called the most radical intervention of the Fed in the private sector thus far,¹⁵³ entailed the injection of \$85 billion of funds into AIG in return for a 79.9 equity stake in the company.¹⁵⁴ AIG is however charged a punitive rate at 850 basis points over the three month LIBOR (London Inter-Bank Offered Rate) for the loan which is collateralized against the best assets of AIG as security including the assets of subsidiaries of the insurer. Furthermore the existing management was also replaced as was also the case in the bailout of Fannie Mae and Freddie Mac.¹⁵⁵

The reasoning behind the bailout of this insurer rested on the tentacle-like connections of the insurer with the financial system as a whole. The insurer has policy holders in more than 100 countries and insures deals and investments across the globe.¹⁵⁶ The many ties with the financial system made it a nexus for capital insurance coverage. With its \$441 billion dollar exposure to credit default swaps and other derivatives the collapse of this insurance giant would provide a devastating blow to business and wipe out the insurance coverage of customers exactly when it is needed the most. Cancelling the insurance it underwrote would cause further write downs in markets, reduce lending and precipitate a worsening of the crisis.¹⁵⁷ The governor of New York commented on the extensive businesses of the insurer saying that there are so many business interests that it would be hard to predict how widespread its bankruptcy would have been felt by the markets. Analysts however were in agreement that due to the high level of interconnectedness with world markets the failure of AIG

¹⁵¹ "Turmoil as US Weighs AIG Rescue", The Financial Times, September 17, 2008

¹⁵² Roubini, Nouriel, "The Shadow Banking System is Unraveling", The Financial Times, September 21, 2008

¹⁵³ "US Government rescues insurer AIG", BBC, September 17, 2008

¹⁵⁴ "Turmoil as US Weighs AIG Rescue", The Financial Times, September 17, 2008

¹⁵⁵ "Changing the Rules of the Game", The Financial Times, September 17, 2008

¹⁵⁶ "US Government rescues insurer AIG", BBC, September 17, 2008

¹⁵⁷ "Changing the Rules of the Game", The Financial Times, September 17, 2008

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would have had a greater impact on financial markets than the failure of Bear Stearns.¹⁵⁸ Analysts at RBC estimated that the demise of AIG could have resulted in more than \$180 billion dollars of losses for financial institutions.¹⁵⁹

Reflecting the importance of AIG for market stability President Bush stated that the rescue was; "*(...) to promote stability in the financial markets*".¹⁶⁰

With the refusal to bailout Lehman Brothers the Fed is actually making an example of this investment bank. Following several large bailouts the Fed had reached its limit and judged that the financial system could take the loss of Lehman Brothers. At the same time this reluctance to assist Lehman Brothers would serve as a reminder to other large financial institutions that help is not always guaranteed. The mission of the Fed is to ensure financial stability so if they think that the system will survive the failure of a large financial institution will surely be allowed. This includes a firm as large as Lehman. So in essence this lack of response also has important ramifications for the Fed in the future as it is aimed at reducing the risks of moral hazard and warning financial institutions that they too should tread carefully in the future.

AIG is however an example of a financial institution that is too large and too interconnected to fail. This goes twice in hard times like these when so many companies are dependent upon the credit default swap arrangements made with AIG. So however illiquid and insolvent the company may have been, the failure of the company would have devastated confidence in the system as well as worsened the financial integrity of policy holders further. Again this case displays characteristics that are described in the Banking view. The too large to fail ideology seems to be live and well in the US thus ensuring the companies that truly are too large or too interconnected to fail that help is almost sure to be extended in the future also.

7.4.3.4 Sub Conclusion

Starting with the bail out of Bear Stearns the crisis has wreaked havoc in the financial markets. As months progressed several other large firms found themselves in financial distress and were

¹⁵⁸ "US Government rescues insurer AIG", BBC, September 17, 2008

¹⁵⁹ "Finance Crisis: in Graphics", BBC, October 6, 2008

¹⁶⁰ "Turmoil as US Weighs AIG Rescue", The Financial Times, September 17, 2008

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compelled to turn to the Fed which in most cases came through for the companies and provided much needed aid.

Bear Stearns was hit hard on losses in hedge funds and the investor insecurity that ensued lead to a regular run on the investment bank which consequently lead to illiquidity. Thus Fed officials found it necessary to step in and assist the seemingly solvent investment bank with a loan using J.P. Morgan Chase as intermediary. As this loan wasn't sufficient the Fed assisted by purchasing \$30 billion dollars of hard to trade securities that Bear Stearns had on its book. But there was a snag in the help that was offered by the Fed as a penalty was imposed on Bear Stearns shareholders in the form of a low selling price in shares. The response of the Fed was revolutionary as this was the first time since the 1930's that an investment bank has received LOLR assistance. The bailout of the illiquid company was done by the Fed assuming responsibility for the billions of dollars in suspicious assets.

The nationalization of Fannie Mae and Freddie Mac was the next big step in the chores of the Fed. The Fed injected \$100 billion dollars in each of the government sponsored enterprises thus providing liquidity and solvency to the companies. The status of the companies as government sponsored enterprises surely had a role in the matter but another important factor was the importance of the companies in sustaining confidence in the financial markets as their demise surely would have been devastating to the entire financial system.

Following the failure of Lehman Brothers the Fed seemingly was fed up with assisting individual institutions and did not intervene. Reluctance to use any more tax payer funds and the risk of moral hazard may have been the prime reasons behind this decision.

The reluctance to intervene was however reversed as the international insurer AIG showed signs of distress. Having lost heaps of money on underwriting obligations the company was on the verge of failure. The company was deemed to be essential to the entire financial system because of the underwriting it performed in many companies the world over. Thus the company can be said to be too large or too interconnected to fail. Consequently the Fed stepped in and injected liquidity to keep the company solvent and able to operate. This intervention has been the most radical intervention in the public sector so far.

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7.4.4 Policy of the Fed

As we now have illuminated the decision that the Fed has made in response to the consequences of the crisis we may not consider it in light of the reviewed theory. What we have in months past seen a Fed that has been more active than it seldom has been before and utilized a wider array of tools than have seen before. As new problems and challenges presented themselves the Fed has constantly been compelled to reinvent itself on a micro- as well as on a macro level to address the issues at hand.

A proposition that almost all of the theories are in agreement upon is the macro economic responsibilities of the Fed.¹⁶¹ What we have seen in the aftermath of the crisis is that as the interbank lending market dried up and rates started to soar, open market operations formed the first line of defense against the chocks to the financial system. Open market operations were however not performing satisfactory as is obvious with the facilities that were later initiated by the Fed. The malfunction of the interbank lending market ruled out the use of the money view as it would not have been efficient in any way. Instead new facilities were created. The Fed's lenience in these facilities is an important factor to point out. What was actually seen was that the Fed started to accept highly doubtful collateral for Treasury securities via the facilities.

As losses amounted among financial institutions these began to crumble and almost all of the biggest companies received assistance from the Fed. Bear Stearns was the first of these as the company lost its liquidity due to the suspicions of investors. The company was seemingly solvent however and the Fed granted a bail out of the investment bank. Given their status as government sponsored enterprises (and their importance for the economy as a whole) it was expected that Fannie May and Freddie Mac would eventually receive the much needed assistance from the Fed. The question is however if this was the right thing to do as both companies were seemingly illiquid as well as insolvent. The same was the case in the matter of the bail out offered to AIG as it is doubtful whether this company was solvent or not at the time. Bear Stearns stands out in this regard as it was seemingly solvent at the time of its collapse. Be that as it may the Fed judged all these companies too important to fail. The responses however do carry the traits of the banking school within LOLR theory. Time and time again the Fed has shown its commitment to try to maintain financial stability with more and more radical moves. In the process large, illiquid and insolvent

¹⁶¹As already mentioned the Free Banking View does not see a necessity for any LOLR responses at all

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companies received a helping hand although the case can be made that the situation was brought on by them selves. These responses have obvious moral hazard implications, which are also recognized by Goodhart, but the Fed has shown through its actions that future systemic risk is of secondary importance when it is the system itself that is at risk.

7.5 Conclusion

We have analyzed the SCC by using the Minsky-Kindleberger model as a framework on the macro level and showed that our findings can be supported by their theoretical viewpoints.

Financial innovation in the subprime mortgage lending market is in our analysis characterized as the displacement.

In order to speed up the recovery of the US economy after the recession that followed after the burst of the dot com bubble the Fed lowered the interest rate level significantly. However, as Minsky (1977) emphasized, LOLR intervention “*can soon lead to a resumption of an inflationary boom*”. So a boom in real estate succeeded the dot com and induced subprime mortgage lenders to follow lax lending standards which further made investment in real estate to financially unstable subprime borrowers accessible.

The “Originate and Distribute” strategy further worsened the case as it led financial institutions to issue unsecure subprime loans, securitize them and sell them off to high yield seeking investors. This enabled financial institutions to write loans of their books and onto the SIV’s and essentially expanding their lending business by originating more loans. This was possible because of the regulatory setup in regards to the less needed capital to meet bank regulatory requirements on off balance sheets. The risk was however high as SIV’s were not eligible to LOLR assistance.

The incentives behind financial innovation – the culpable behavior amongst subprime lenders – were the soaring real estate prices and the very low interest rate level during 2002/2003 till 2005. This resulted in the boom being financed by the expansion of credit.

Credit rating agencies likewise played a vital role in this context as they provided high ratings on MBS’ and CDO’s and thus induced the investment in these securities. The critique has been centered on the issue of conflict of interest as credit rating agencies simultaneously were being paid by the originators for their services.

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Euphoria in the US real estate market emerged as prices continued to increase and the Fed continuing to keep the funds rate at a very low level. Houses became objects of speculation rather than being viewed as ‘homes’. More and more wanted a piece of the action and many of the new investors – first buyers – were subprime borrowers. This again contributed to the increase in real estate prices.

By this point in time lenders introduced the so-called NINJA loans, which set aside almost every bit of documentation required on mortgage borrowers, especially subprime borrowers. This is a clear cut picture of the level of overtrading during this period of the SCC.

Concerned voices were at a relatively early stage – during the speculative frenzy – questioning the sustainability and fragility of the “new era” and accentuate that it might have been based on “irrational exuberance”. However, due to the mindset of investors and soaring real estate prices the concerns were at this point in time ignored.

Financial distress is likely to follow as asset prices begin to decline (Kindleberger, 2005, p. 77). By mid 2006 real estate prices were decreasing across the American soil and the belief of a new era was diminishing. Financial institutions began to tighten their lending practices which made credit less accessible. Many subprime borrowers were by now facing the higher rates in their ARM’s whilst simultaneously paying on a loan that is more worth than their house. Subsequently many subprime borrowers chose to default on their mortgage loans.

The concerned voices, that now included a broader spectrum of economists, investors and experts, found that the timing was right and expressed their warnings for the future to come. This contributed to the loss of confidence in the markets, as the “Originate and Distribute” strategy had spread the risk onto several markets and institutions that were holding the toxic assets.

A credit crunch emerged as financial institutions tightened their lending practices. This was also an issue amongst the institutions themselves as there resided great uncertainty of the level of losses and uncertainty on who carried great exposure – there still does. On the 18th of July 2007 Bear Stearns declared publicly that two of its hedge funds, which were heavily engaged in subprime mortgage related assets, were not able to pay out to their investors due to the lack of assistance from other financial institutions

The 9th of August 2007 was the day that changed the American economy. French investment bank, BNP Paribas, announced that that it was not able to value assets in two of its hedge funds owing to a “*complete evaporation of liquidity in the (subprime) market*”. This statement accentuated the

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problems in regards to the values on subprime related assets and finally led to the conclusion that they were worthless. A panic amongst financial institutions followed as these began to fear run on banks, thus the demand for high powered money increased dramatically. This led to the collapse of the ABCP market. Simultaneously credit in the interbank lending market tightened and financial institutions were preparing for the trouble ahead by trying to secure a comprehensive liquidity reserve.

Banks incurred significant losses through their SIV's that would turn out to threaten the liquidity and solvency of major banks and other corporations. The 'too big to fail' phrase was by now commonly used in the media as the Fed has bailed out some of the big players – either by directly providing them with liquidity or via the takeover of other strong institutions.

Due to the magnitude of the SCC the level of systemic risk has so far been high as many sectors and markets have been affected by the tumult. Thus, the magnitude of the assistance by the Fed has been extraordinary because it is not exclusively banks that are in need of help.

The SCC is still present and continues to wreak havoc. It is difficult to predict how the future course of actions will take place and where to will they navigate the US economy. Nonetheless, events leading up till present time have been disastrous and there resides great consensus amongst economists and experts that the US economy in the immediate future will find itself in a state of recession – if this already is not a reality. However it might be we consider a recession to be highly probable in the near future to come as effects on the real economy have become a reality and the US economy is at current time experiencing a slow growth.

The Government along with the Fed has made immense efforts of preventing a debt deflation cycle from ensuing, thus so far having been able to prevent a depression. Is it possible to prevent a depression in the long run? This is difficult to predict at present time. America will have a new President in the near future and judging by the current polls it looks to be a Democrat. His viewpoints on the SCC and how the crisis is to be handled might – and probably do – deviate from those of President Bush and his office. However, if deflation becomes a reality and the new Government and the Fed, in the long run, begins to draw a line on its funding and assistance then a depression is likely to follow a recession.

Originators acted rationally in context to market conditions during the real estate bubble where the demand for subprime loans was high and subprime borrowers usually were imperfectly informed

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and irrational. However, the behavior of originators in regards to their expectations of the future real estate price development and the belief of a new era is characterized as irrational.

Overconfidence and greed came to light as originators obtained extraordinary profits even though economists and experts began to question the sustainability of the real estate price level. Fraudulent and culpable behavior is based on the “Originate and Distribute” strategy and the lax lending standards, i.e. liar loans, which further provided substantial profit for originators on behalf of others. Originators were aware of the unstable financial situation of subprime borrowers but continued nonetheless to grant them mortgage loans in an effort of gaining profit no matter the consequences.

The “Originate and Distribute” strategy posed another setback as the underlying risk was distributed to other investors, thus minimizing the incentives for originators to follow the performance of the loans and enabling them to lend more aggressively to subprime borrowers. As there is little repeat business in the subprime mortgage lending market originators were less likely not to ‘abuse’ subprime borrowers in order to obtain a good reputation. It was all about the selling.

The behavior of subprime borrowers was influenced by their bounded rationality. In an effort of simplifying their investment decisions they isolated important measures such as the interest rate and the total amount of debt on the loan and focused too much of their attention on the monthly payments and initial low teaser rates. Making a payment with a very low interest rate today is not the same as being able to meet the entire loan when interest rates fluctuate over say 30 years. This in turn led subprime borrowers to underestimate the probability of default. Furthermore, the pessimistic character of subprime borrowers restricted them not to shop around for the cheapest loan and the myopic character made them overvalue short term gains. This stimulated originators to offer complex loans with hidden fees.

Subprime borrowers were overoptimistic of their ability to meet the monthly payments by cutting back on expenses and working overtime or getting a second job. Moreover, they do not control the supply of work, thus suffering of the illusion of control.

Subprime borrowers were partly driven by greed in their efforts of obtaining a short term profit by speculating in real estate. Their strategy was overoptimistically based on ever increasing real estate prices and on the belief of exiting the market without incurring losses. As prices stopped increasing many subprime borrowers came to loose on this strategy. Furthermore, subprime borrowers

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overestimated the correlation between past and future real estate prices movements due to their bounded rationality.

Emotions likewise played vital role in the decision making of subprime borrowers. Belonging to the lower classes in society they believed that by investing in real estate during the boom they could obtain substantial profits that would enable them to enhance their social status. With this in mind and the fear of being denied a loan to enter the real estate market subprime borrowers were willing to take on the first offer that they initially could “afford”. Originators used this opportunity in their marketing campaigns to frame different elements, such as “the power of yes”, and moving the attention away from the true costs of the loans.

The short term perspective of subprime borrowers had serious consequences to the course of events of the SCC as it invoked loss aversion. When real estate prices began to decrease the value of the house went below the value of the loan for many subprime borrowers and many chose to default of their mortgage loans. However, if economists and experts had made significant attempts to reframe the perception of subprime borrowers from short term to long term things might not have gone so far.

Since the outbreak of the crisis in August 2007 the Fed has been kept steadily busy with its LOLR responses that have been conducted in order to preserve market stability. The responses have first been carried out on a macro-level and were later broadened to include assistance to individual companies as well, as problems spread throughout the financial markets.

The first symptoms of troubles in the financial markets appeared as the market for interbank lending froze up when banks started to hoard cash and became unwilling to lend to each other. This is not sustainable in a fractional reserve banking system as banks and other financial institutions depend on the free flow of money in order to maintain liquidity and capital reserve requirements. Open market operations that had proven its efficiency as a monetary tool in the past however did not provide sufficient relief from these troubles in the interbank market. The TAF with its combined characteristics of open market operations and direct lending proved to be somewhat more successful. Given the conditions in the interbank lending market the money view would have been irrelevant. In order for this view to have any real positive effect the markets must be functioning so as to weed out the “bad seeds” themselves. This would in theory have made individual responses superfluous as only the solvent banks would be left.

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The facilities that followed in the months to follow were created on the basis of different problems in the financial markets but both represent ground breaking initiatives started by the Fed. In the case of the TSLF we observed that treasury securities were granted to financial institutions in exchange for mortgage bonds for which the market had dried up. The granting of treasury securities, which are as good as cash, in exchange for unsellable bonds represents a marked point of controversy as the collateral accepted is of the dubious kind. This is in direct opposition with the teachings of Bagehot and others of the classical view.

The PDCF is also of equal importance as we here saw the dawn of a new era where the Fed expanded its safety net to also include institutions outside its regulatory and supervisory purview.

These exceptions from the normal workings of the Fed have also made their mark in the assistance offered to individual financial institutions. The first of these was in the case of the takeover of Bear Stearns by J.P. Morgan Chase. Here the Fed assisted first with an indirect loan through J.P. Morgan Chase who has access to the federal safety net and when this was not enough the Fed in effect assumed responsibility of billions of dollars in risky asset that formerly belonged to Bear Stearns whilst J.P. Morgan Chase took over the investment bank at pennies on the dollar. The price that J.P. Morgan Chase would be willing to pay was lowered to \$2 dollars per share in an attempt to penalize the company shareholders and discourage future moral hazard from other financial institutions. The same was the case in the matter of the bailouts of Fannie Mae, Freddie Mac and AIG where the management was replaced and the Fed took over control. Yet again the bailouts were granted with suspicious securities as collateral. Furthermore the companies were not only illiquid but also insolvent. All these are factors that sure to promote an increased risk of moral hazard and systemic risk in years to come. In these cases we again saw the face of a new Fed that did not restrict itself to institutions within the Federal Reserve System, but assumed responsibility of institutions outside as well, all in the name of maintaining the stability of the US financial markets. The core argument for the bailouts was that the companies are in fact too vital for the financial system to be allowed to fail. In other words they are too big or too interconnected to be allowed to fail. This is especially the case in such volatile times as these. The moral hazard issue should however not be ignored in this case as such responses from the Fed may embolden others to take excessive risks in the future confident that the Fed will extend a helping hand. The failure of Lehman Brothers and the subsequent reluctance of the Fed to help however may purvey word of caution to others that help is

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not always a guarantee and individual firms will be allowed to fail if it is judged that the integrity of the financial system will be maintained.

The responses of the Fed so far all point to an adherence to the teachings of Charles Goodhart that recommends assistance to solvent as well as insolvent firms as the failure of a large firm may endanger the confidence in the whole financial system. This again leads to contagion and a worsening of the crisis.

7.6 Perspectives

In our methodology we argued for the use of the Minsky-Kindleberger model as the theoretical foundation for our analysis on the SCC on a macro level. Hereby we effectively and deliberately chose not to use the model put forth by monetarists as the explanation for the occurrence of ‘real’ financial crises. If however we had chosen to implement this model instead we would have focused on the Fed as the protagonist in the occurrence of the crisis. As this model leans on the inherent rationality of market participators and the perfection of the market mechanisms it solely recognizes exogenous factors as reasons behind crisis. Therefore it is up to the Fed to regulate the money supply and thus to prevent a crisis in the end. The mere occurrence of the SCC must therefore entail that the Fed has not fulfilled its obligation to keep the money supply and thereby the markets at equilibrium. As aforementioned, Friedman (1962) emphasizes the importance of implementing regulation on the actions of the Fed in order to minimize the probability of wrong policy making generating financial crises.

It is our conviction that this explanation relies too heavily on exogenous factors as reasons for the occurrence of the SCC. If this model had been followed it would have entailed a disregard for the irrationality of man. Bypassing the Olympian model however opens up for the recognition that rates set by the Fed is important but does not provide all of the answers. Therefore one has to delve deeper into the endogenous factors that also played their part.

This was done by focusing on macro – as well as micro – economical features of the financial markets in relation to the occurrence of the SCC. The macro economical studies were conducted using the framework of Minsky-Kindleberger whilst theories on corporate/managerial failure and financial psychology formed the basis for a micro level study. On the micro level we focused on the

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behavior of lenders and borrowers. However, other areas could with advantage have been included in this analysis. An analysis of the behavior of other participant, including credit rating agencies and financial institutions, is likewise relevant in this connection. These were though not included due to space limitations and because we are of the opinion that the issue of lenders and borrowers lies at the heart of the matter. However, in order to obtain a thorough understanding of the behavior of a greater selection of participants on an institutional and individual level would have given other results compared to our findings which are mainly based on macro level observations. Moreover, merely operating on the micro level brings with it a very detailed analysis but does not provide a greater overview of the course of events.

The SCC has since its outbreak affected the volatility of stocks dramatically. People have shown signs of fire selling due to lack of confidence amongst investors. It is important for the Fed, the Government and other institutions to make efforts at reframing the perceptions of investors and minimizing loss aversion. Especially the stock prices of financial institutions have experienced significant decreases due to the SCC. We have seen recent examples of politicians, economists and experts emphasizing that there is money to be made due to “cheap” shares which can get people to enter the market again and thus help restoring market confidence. However, investors are still cautious, particularly concerning shares of financial institutions, and if this continues for a long period of time it is sure to bring down otherwise solvent firms and banks.

We have in the last year observed a Fed that has had to evolve in order to come to grips with the changes in the financial markets. In the aftermath of the crisis it will however be important to address relevant issues that are at the heart of recent revolutionary responses. The lightly regulated businesses that are so important for today’s financial markets need to learn their place in their relation to the LOLR and vice versa. Whether it is by regulation and/or supervision codes of conduct need to be set that will allow for a more stabile financial system. Depository institutions have been willing to submit to supervision and regulation in exchange for access to the federal safety net. The possibility of imposing the same conditions on other financial institutions must now be considered in the wake of recent events.

Also the loopholes within the commercial banking industry must be addressed in the future. Here in particular the exploitation of the “originate and distribute” model by commercial banks in order to bypass minimum capital requirements.

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In order to avoid massive moral hazard problems and a repeat of today's financial crisis the recent bailouts of non depository financial institutions for bad collateral must therefore bring with it repercussions on the lightly regulated financial sector. Otherwise we are sure to see financial calamities equal to the SCC or bigger yet, in the future too.

8 List of Literature

8.1 Working Papers

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