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THE GLOBAL FINANCIAL CRISIS DISSECTION

by

YIJUN LI

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in the

FACULTY OF COMMERCE LAW AND MANAGEMENT

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at the

UNIVERSITY OF THE WITWATERSRAND

SUPERVISOR: **PROFESSOR Eric Schaling**

Declaration

I, Yijun Li, declare that the research work reported in this dissertation is my own, except where otherwise indicated and acknowledged. It is submitted for the degree of Master in the University of the Witwatersrand, Johannesburg. This thesis has not, either in whole or in part, been submitted for a degree or diploma to any other universities.

Signature of candidate Date July 21, 2011

Abstract

A financial crisis is consisted by a major event or a series of events. Event analysis can be used to analyse the causes of the financial crisis. In this paper, we use the Bear Stearns event and the Lehman Brothers event to analyse the causes of the Global Financial Crisis, find the weakness of our financial system and therefore, we suggest remedy the regulatory shortcomings and intensify the international cooperation within central banks and international financial organisations.

Acknowledgements

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1. Introduction

"*Change we can believe in*" (Obama, 2008).

On 4 November 2008, Barack H. Obama was elected the 44th President of the United States. This was fated to be an epochal event. At the beginning of the elections, American voters considered there to be just one core discussion topic in this election: the Iraq war. However, as time passed, American encountered another unique topic: the financial crisis, the deepest global financial crisis since the Great Depression of 1929, which lasted until 1933.

Even the most far-sighted politicians and financiers could not have forecasted that this financial crisis, which originated from the sub-prime loan crisis which started at the beginning of 2007, would so rapidly, widely and deeply influence the global economy, politics and even ideology. On this basis, Obama's "change" slogan hit the point; the future of the United States and the world was full of uncertainty.

From the insolvency of Bear Stearns to the collapse of Lehman Brothers; from the CEOs' resignations from Merrill Lynch and Citigroup to the nationalisation of Fannie Mae and Freddie Mac; from the cooperative action of many central banks injecting the liquidity into the markets to Paulson's bailout plan, we review the whole process of this global financial crisis, and must ask the following questions: Why did Wall Street's high leverage model not work any longer? What kind of mistakes did the financial engineers make? Why did they design these complex derivative instruments? Does this crisis have any relationship to the global imbalances? What should governments and regulatory agencies do in order to prevent future crises?

To answer these questions, we have to look back at the process of this global financial crisis to its beginnings then analyse the events during this period, and find out what caused it. To find out the causes of this global financial crisis we must inspect the weaknesses in our society, in our thinking and in our financial systems. This financial crisis is not the first crisis in human's history, and we do not expect it to be the last, but if we can find out the causes of mistakes which were recently made, it will provide us with a way to avoid the same problems in the future. This is important in order to improve the health of our financial system, and this therefore is the main purpose of this study. Thus, the job of this study is clear: to find out the causes of the global financial crisis, to point

out the weaknesses in our financial systems, and if possible, to provide the solution, or at least some suggestions towards a solution.

2. Methodology

A financial crisis is usually preceded by a major event or a series of events. These events can include a debt default, corporate bankruptcy, assets' price slumps, equity market collapses, currency crashes, etc. The current global financial crisis consisted of a series of events. If we can analyse each one, we can certainly find the reasons for the markets' falling. But this process would be tedious and unnecessary, because the global financial crisis consists of thousands of events and many of them have similar characteristics. So we need to choose some typical events which represent all of those which had the highest impact at the time. Through the analysis of these events, we will be more easily able to understand the causes of this crisis.

For the purpose of choosing the most representative and significant events which we need to analyse, we use the following principles:

Size: The impact of this event must have a considerable influence on the market. For example, if the event is a bankruptcy of a corporation, this corporation must be of considerable size and have an important position in its industry.

Time: The event which is chosen must have occurred at a key point in time during the financial crisis, meaning that it is not a random event or a consequence of some other events. This event should happen at a key point in time during the global financial crisis.

Representative: The cause of this event should be representative. The mistakes people made or the weakness of the financial systems which caused this event can represent other events during this financial crisis.

This study uses academic research as a main source for doing the qualitative analysis; other information comes from financial journals and the internet. We also understand that even the most representative event still has minor differences with other events. So when we analyse the events, we will only focus on finding the general causes, rather than the events' unique characteristics.

3. Global Financial Crisis Overview

The global financial crisis (GFC) is considered by many economists to be the worst financial crisis since the Great Depression of the 1930s. It was triggered by “a liquidity shortfall in the United States banking system” (Ivry, 2008) and has resulted in the collapse of large financial institutions, the bailout of banks by national governments, and downturns in stock markets around the world.

The GFC started to emerge in the spring of 2007. In the previous several years, the American housing market experienced a boom period and housing prices reached a peak in 2006. After that, housing prices declined, resulting in numerous evictions, foreclosures and prolonged vacancies, causing the value of mortgage-backed securities to fall. Many financial institutions who held these securities suffered large losses. In April of 2007, New Century Financial, the largest U.S. sub-prime lender, was bankrupt. This indicated the first crack in the Wall Street myth of the new financial innovation since 2001. In June, two Bear Stearns hedge fund insolvencies shocked the market. Two fund managers were accused for misleading investors. But soon the impact of this event exceeded personal lawsuits. The whole of Wall Street was blamed. In August, central banks around the world cooperated to inject funds into the financial markets, to try to solve the problem of the “liquidity shortfall”. But this did not stop the spreading plague. In the midst of the chaos, the world entered 2008, an even more chaotic year. In January, global stock markets suffered big losses. On 21 January 2008 the FTSE 100 index fell 5.5 per cent. It was the biggest one-day loss since 11 September 2001. U.S. home prices continued to drop. They dropped 15.8 per cent in May; the steepest one-month drop since the index had been started eight years previously, eclipsing the 15.3 per cent drop in April (Cox & Glapa, 2009:10). On September 7, the Federal Reserve nationalised Fannie Mae and Freddie Mac[1]. One week after this nationalisation, on September 15, Lehman Brothers applied for bankruptcy protection. The financial crisis had evolved to its apex. On 3 October 2008, U.S. President George W. Bush signed the Emergency Economic Stabilisation Act, creating a U.S. $700 billion Troubled Assets Relief Program to purchase failing bank assets. After a huge injection of funds into the markets the situation became stable in America, but the turmoil did not stop in the rest of the world. On 14 January 2009, Standard & Poor’s (S&P) cut Greece’s credit rating[2] on debt, the GFC spread to Europe and the European debt crisis began.

To provide a more detailed description, we drew up Appendix A: Global Financial Crisis Impact Timeline. In this Appendix, we start at the year 2000 and close at year 2009. We note details of important incidents in the United States and other countries, such as bankruptcies and takeovers, and give information and statistics about relevant trends. It also includes the United States and other countries' (major focus on U.S.) enactments of government laws and regulations, as well as public and private actions which affected the housing industry and related banking and investment activity.

4. Events Analysis

We chose the Bear Stearns event and the Lehman Brothers event for the event analysis. The reasons for choosing Bear Stearns and Lehman Brothers are that they were substantial institutions and they had an important influence on the financial industry; additionally, the causes which made them fall are also the causes which made most of the other financial institutions fall. Finally, they failed at the key point of time in the process of this financial crisis. Bear Stearns fell in the mid 2007, which represents the beginning of GFC and its fall leads a series of companies' fall. Lehman Brothers fell in September, 2008 and heavily impacted global financial markets. Lehman Brothers' fall forced the largest banks in the world and many central banks to inject more funds into the markets to mitigate its negative effects.[3] After that, when no more of the largest institutions fell, the global financial crisis became stable. So Lehman Brothers' fall indicated that the GFC reached its peak.

4.1 The Bear Stearns Event

Bear Stearns Companies, Inc. based in New York City, was a leading investment bank and provider of securities trading and brokerage. The main business included three principal areas: Capital Markets, Global Clearing Services, and Wealth Management. According to the net revenue distributions of 2006, capital markets (equities, fixed income, investment banking) comprised just under 80 per cent, wealth management comprised under 10 per cent, and global clearing services, 12 per cent.

Bear Stearns had grown significantly since 2000. In 2005-2007, Bear Stearns was recognised as the "most admired" securities firm in *Fortune*'s "America's Most Admired Companies" survey, and was second overall in the securities firm section. The annual survey is a prestigious ranking of employee talent, quality of risk management and business innovation. This was the second time

in three years that Bear Stearns had achieved this top distinction. As of 30 November 2006, the company had a total capital of approximately U.S. $66.7 billion and total assets of U.S. $350.4 billion. According to the April 2005 issue of *Institutional Investor magazine*, Bear Stearns was the seventh-largest securities firm in terms of total capital.

On 7 June 2007, Bear Stearns informed investors that in two of its funds, the High-Grade Structured Credit Strategies Enhanced Leverage Fund (HGELF) and the High-Grade Structured Credit Fund (HGF) it was halting redemptions because of liquidity problems. HGELF had lost 23 per cent of its value since January 2007, including almost 19 per cent in April alone (Cox & Glapa, 2009:2).

On 22 June 2007, Bear Stearns pledged a collateralised loan of up to U.S. $3.2 billion to "bail out" HGF, while negotiating with other banks to loan money against collateral to HGELF. Bear Stearns had originally put up just U.S. $35 million, so they were hesitant about the bailout, and CEO James Cayne and other senior executives worried about the damage to the company's reputation (Bajaj & Creswell, 2007). These two funds were invested in thinly traded collateralised debt obligations (CDOs) [4]. Merrill Lynch seized U.S. $850 million worth of the underlying collateral which was pledged by Bear Stearns but was only able to auction off U.S. $100 million of it. The incident sparked concern of contagion, as Bear Stearns might be forced to liquidate its CDOs, prompting a mark-down of similar assets in other portfolios (Siew & Yoon, 2007; Pittman, 2007). During the week of 16 July 2007, Bear Stearns disclosed that two of their sub-prime hedge funds had lost nearly all of their value amid a rapid decline in the market for sub-prime mortgages.

On 1 August 2007, investors in the two funds took action against Bear Stearns and its top board and risk management managers and officers. This was the first legal action made against Bear Stearns, though there have been several others since.

On 14 March 2008, the Federal Reserve Bank of New York agreed to provide a U.S. $25 billion loan to Bear Stearns, collateralised by free and clear assets from Bear Stearns, in order to provide it with the liquidity for up to 28 days that the market was refusing to provide. Apparently, the Federal Reserve Bank of New York then had a change of heart and told Bear Stearns that the 28-day loan was unavailable to them. The deal was then changed to one where the

NY Fed would make a US$30 billion loan to JP Morgan (collaterallised not by any JP Morgan assets but by Bear Stearns' assets), who would then buy Bear Stearns for US$2 per share (Barr & Morcroff, 2008). Two days later, on 16 March 2008, Bear Stearns signed a merger agreement with JP Morgan Chase in a stock swap worth US$2 a share, or less than 7 per cent of Bear Stearns' market value just two days before (Onaran, 2008). This sale price represented a staggering loss, as its stock had traded at US$172 a share as late as January 2007 and US$93 a share as late as February 2008.

On 24 March 2008, a class action lawsuit was filed on behalf of Bear Stearns' shareholders, challenging the terms of JP Morgan's recently announced acquisition of Bear Stearns. That same day a new agreement was reached that raised JP Morgan Chase's offer to US$10 a share, up from the initial US$2 offer, which meant an offer of US$1.2 billion (Dash & Thomas, 2008). The revised deal was aimed to quiet upset investors and any subsequent legal action brought against JP Morgan Chase as a result of the deal, as well as to prevent Bear Stearns' employees, many of whose past compensation had consisted of Bear Stearns stock, from leaving for other firms. On 29 May, Bear Stearns shareholders approved the sale to JP Morgan Chase at the US$10 per share price (White, 2008).

4.2 The Lehman Brothers Event

Lehman Brothers Holdings Inc. was a global financial services firm (4th largest investment bank in the U.S. behind Goldman Sachs, Morgan Stanley, and Merrill Lynch) with businesses in investment banking, equity and fixed-income sales, research and trading, investment management, private equity and private banking. It was a primary dealer in the U.S. Treasury securities market.

In August 2007, Lehman Brothers closed its sub-prime lender, BNC Mortgage, eliminating 1,200 positions in 23 locations, and took an after-tax charge of US$25 million and a US$27 million reduction in goodwill. Lehman announced that poor market conditions in the mortgage space "necessitated a substantial reduction in its resources and capacity in the sub-prime space" (Kulikowski, 2007).

In 2008, Lehman faced an unprecedented loss due to the continuing sub-prime mortgage crisis. Lehman's loss was a result of having held onto large positions in sub-prime and other lower-rated mortgage tranches when securing the underlying mortgages. In many events, huge losses accrued in lower-rated

mortgage-backed securities throughout 2008. Anderson and Dash (2008) show that in the second fiscal quarter, Lehman reported losses of US$2.8 billion and was forced to sell off US$6 billion in assets; in the first half of 2008 alone, Lehman stock lost 73 per cent of its value as the credit market continued to tighten; in August 2008, Lehman reported that it intended to release 6 per cent of its work force, 1,500 people, just ahead of its third-quarter-reporting deadline in September.

Investor confidence continued to erode as Lehman's stock lost roughly half its value and pushed the S&P 500 down 3.4 per cent on September 9. The Dow Jones lost 300 points the same day on investors' concerns about the security of the bank (Times-Picayune, 2008). The U.S. government did not announce any plans to assist Lehman (Anderson & White, 2008). The next day, Lehman announced a loss of US$3.9 billion and their intent to sell off a majority stake in their investment-management business (Bruno, 2008; White, 2008). The stock slid seven per cent that day (Bruno, 2008). Lehman, after earlier rejecting questions on the sale of the company, was reportedly searching for a buyer as its stock price dropped another 40 per cent on 11 September 2008 (Anderson, 2008).

On Saturday, 13 September 2008, Timothy F. Geithner, the president of the Federal Reserve Bank of New York called a meeting on the future of Lehman Brothers, which included the possibility of an emergency liquidation of its assets (Anderson, Andrews, Bajaj & Dash, 2008). Lehman reported that it had been in talks with Bank of America and Barclays for the company's possible sale. However, both Barclays and Bank of America ultimately declined to purchase the entire company (Anderson & White, 2008).

On Monday, 15 September 2008, Lehman Brothers Holdings announced it would file for Chapter 11 bankruptcy protection, citing bank debt of US$613 billion, US$155 billion in bond debt, and assets worth US$639 billion. The filing marked the largest bankruptcy in U.S. history (Mamudi, 2008).

5. The Causes of the Global Financial Crisis

When we look back on the fall of Bear Stearns and Lehman Brothers, we find that Bear Stearns was troubled by the CDOs and Lehman Brothers was highly involved in the mortgage-backed securities (MBSs). During the crisis, the prices of CDOs and MBSs crashed and finally, the huge losses on these

assets destroyed Bear Stearns and Lehman Brothers. CDOs and MBSs have similar characteristics; they are both the products of securitisation.

5.1 Securitisation

Securitisation is a structured finance process. It involves lumping together large numbers of individual financial instruments such as mortgages, and then slicing and dicing them into different pieces that appeal to different types of investors (Jones, 2009:7). Securitisation is an innovation in the financial industry. It can transform an illiquid asset, or group of assets into a security with higher liquidity.

We use the mortgage-backed security (MBS) as an example. MBSs are a type of asset-backed security that is secured by a collection of mortgages. The process works as follows:

First, a regulated and authorised financial institution originates numerous mortgages, which are secured by claims against the various properties the mortgagors purchase. Then, all of the individual mortgages are bundled together into a mortgage pool, which is held in trust as the collateral for an MBS. MBSs can be issued by a third-party financial company, such as a large investment banking firm, or by the same bank that originated the mortgages in the first place. Mortgage-backed securities are also issued by aggregators such as Fannie Mae or Freddie Mac in the U.S.

Regardless, the result is the same: a new security is created, backed up by the claims against the mortgagors' assets. This security can be sold to participants in the secondary mortgage market. This market is extremely large, providing a significant amount of liquidity to the group of mortgages, which otherwise would have been quite illiquid on their own.

Furthermore, at the time the MBS is being created, the issuer will often choose to break the mortgage pool into a number of different parts, referred to as tranches. These tranches can be structured in virtually any way the issuer sees fit, allowing the issuer to tailor a single MBS for a variety of risk tolerances. Pension funds will typically invest in high-credit rated mortgage-backed securities, while hedge funds will seek higher returns by investing in those with lower credit ratings (Investopedia, 2010).

The benefit of this securitisation is straightforward. It breaks the limitation of the traditional mortgage mode. In a traditional mortgage loan, a bank

organises a loan to the borrower/homeowner and normally has to hold this mortgage loan until its maturity because the mortgage asset is illiquid and difficult to be traded. With the advent of securitisation, however, the bank no longer needs to hold it to maturity but can sell the mortgages and distribute credit risk to investors through the MBS. By selling the mortgages to other investors, the origination banks replenished their funds, enabling them to issue more loans and generating transaction fees. As with the advantages of securitisation, the disadvantages are also obvious. An investor, who had no chance of touching the risky mortgage assets before, can now hold a huge amount of them. The risk is spread worldwide through securitisation. For example, an Indian investor who has never been to America can have an MBS with some real estate in California as back assets. Certainly, the wealth of this Indian investor is now exposed to the prices of these houses which he never saw. By selling MBSs to different investors, financial institutions received new funds which could be reinvested into the U.S. real estate market. Thus, a continuous money-making circular process is created. With the great profit margins and commissions, these financial institutions further impulse the circulation of this process.

Securitisation accelerated in the mid-1990s. The total amount of mortgage-backed securities issued in the U.S. almost tripled between 1996 and 2007, to $7.3 trillion. The securitised share of sub-prime mortgages (i.e., those passed to third-party investors via MBSs) increased from 54 per cent in 2001, to 75 per cent in 2006 (Demyanyk & Van Hemert, 2008). American homeowners, consumers, and corporations owed roughly $25 trillion during 2008. American banks retained about $8 trillion of that total directly as traditional mortgage loans. Bondholders and other traditional lenders provided another $7 trillion. The remaining $10 trillion came from the securitisation markets. The securitisation markets started to close down in the spring of 2007 and nearly shut down in the autumn of 2008. More than a third of the private credit markets thus became unavailable as a source of funds (Baily & Elliott, 2009). This process is showed in Figure 5.1.

With the development of securitisation, a new door for seeking profit was opening for financial institutions. Under the pressure of having to earn more money, these financial institutions grasped the opportunity to sell those assets which had been difficult to sell without securitisation. And they also borrowed new money to seek new assets. Inevitably, this process brought these financial

institutions new income, but also brought an unforeseen increase to the leverage.

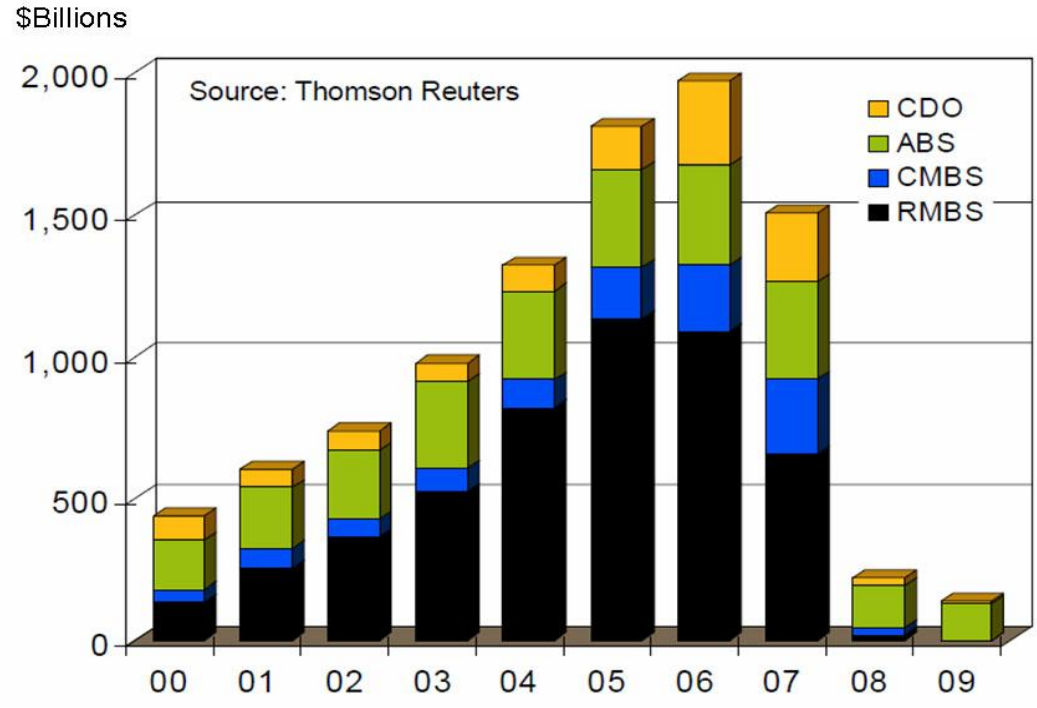


Figure 5.1 Securitisation Market Activity

Sources: Mark Zandi, *The Causes and Current State of the Financial Crisis*, 2010-01-13

Williams (2010:49) refers to leverage as “borrowing funds to invest in pursuit of greater profits than could be had with a firm’s own capital and reflects how much debt a firm is comfortable with as it pursues profit”. The amount of leverage a firm takes is a risk management decision made by the board and senior management and helps define the firm’s risk tolerance. Williams (2010:49) also states: In good times, higher leverage generates higher profit, and in bad times, leverage can kill. For example, a 5 per cent return on US$1 billion of assets is US$50 million. However, if an investment firm decides to add US$1 billion in borrowing, excluding interest cost, the same 5 per cent return magically doubles to US$100 million. In this example, profits were not increased by better investments, but by greater leverage risk.

As of 30 November 2007, Bear Stearns had notional contract amounts of approximately US$13.4 trillion in derivative financial instruments, of which US$1.85 trillion were listed futures and option contracts. In addition, Bear Stearns was carrying more than US$28 billion in “level 3” assets on its books at the end of fiscal 2007 versus a net equity position of only US$11.1 billion.

This US$11.1 billion supported US$395 billion in assets (Boyd, 2008) which means a leverage ratio of 35.5 to 1. High leverage was also used by Lehman Brothers. Lehman Brothers' annual financial statements of 2007 showed an accounting leverage of 30.7 times (US$691 billion in assets divided by US$22 billion in stockholders' equity). While generating tremendous profits during the boom, this vulnerable position meant that just a 3-4 per cent decline in the value of its assets would entirely eliminate its book value or equity (Blackburn, 2008). Figure 5.2 shows the increased leverage ratios of the five biggest U.S. investment banks from 2003-2007.

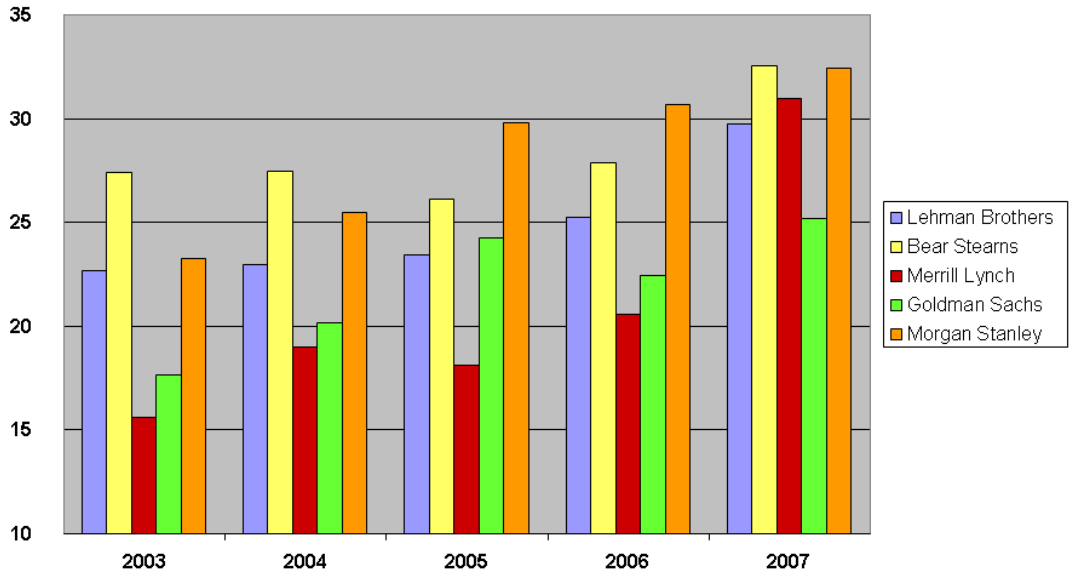


Figure 5.2 Leverage Ratios for Major Investment Banks

Source Data: Company Annual Reports (SEC Form10k)

Notes: The leverage ratio is a measure of the risk taken by a firm; a higher ratio indicates more risk. It is calculated as total debt divided by stockholders equity. Each firm's ratio increased during 2003-2007.

5.2 U.S. Housing Bubble

The boom of the U.S. mortgage-backed security market could not have existed without the boom of the U.S. housing market. Between 1997 and 2006, the price of a typical American house increased by 124 per cent. During the two decades ending in 2001, the national median home price ranged from 2.9 to 3.1 times median household income. This ratio rose to 4.0 in 2004 and 4.6 in 2006. Figure 5.3 shows the median and average sales prices of new homes sold in the U.S. in from 1963 to 2007.

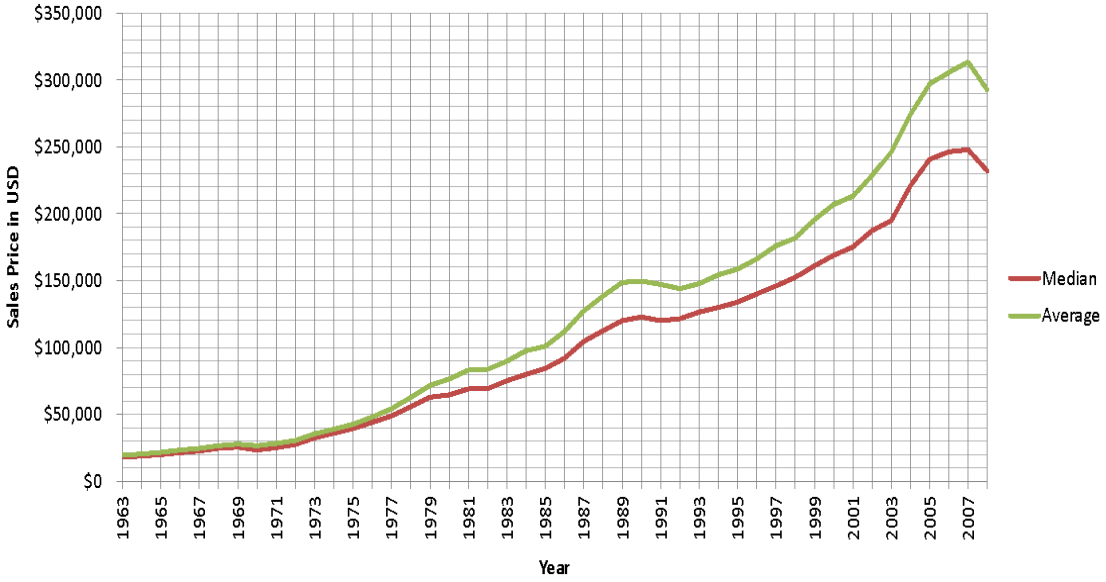


Figure 5.3 Median and Average Sales Prices of New Homes Sold in United States 1963-2008 Annual Data

Sources: Wikipedia, United States Census Bureau, *Median and Average Sales Prices of New Homes Sold in United States 1963-2008 Annual Data,* 2010-01-04

Finding it easier to get credit than ever before and expecting higher housing prices in the future, many Americans started searching for their own dream houses. The USA home ownership rate increased from 64 per cent in 1994 (about where it had been since 1980) to an all-time high of 69.2 per cent in 2004. The increased home ownership rate further pushed up house prices.

The soaring housing prices in the U.S. can be ascribed to two factors: 1. the domestic factor: low interest rates and dangerous financial tools; 2. the international factor: huge inflows of foreign funds.

5.2.1 Low interest rates and dangerous financial tools

The lowering of interest rates had started in 2001, when the Federal Reserve (FED) decided to lower the interest rate to 1 per cent, in order overcome the negative effects of September 11 on the growth of the economy. Under this situation, financial investors represented by investment banks and Wall Street companies were looking for a solid return on their investment beyond the Fed's one per cent interest rate. They capitalised on the opportunity presented by the growing mortgage market in the U.S. Under the pressure of seeking new income, these financial institutions gradually downgraded the qualification requirements of debtors for the new loans. Many debtors who would not have

qualified for loans, according to the old requirements, now got the money to purchase their new houses. These debtors are called sub-prime borrowers. Typically, sub-prime borrowers have weak credit histories and reduced repayment capacity. Sub-prime loans have a higher risk of default than loans to prime borrowers.

The value of American sub-prime mortgages was estimated at $1.3 trillion as of March 2007, with over 7.5 million first-lien sub-prime mortgages outstanding. (The first-lien here refers to a lender in the first or priority position to benefit from any liquidation of the collateral which secures the loan, in the event that the loan is in default and the property is to be sold. An example of a first-lien position would be the bank which holds the original mortgage on a property. The term “first-lien sub-prime mortgage holder” refers to the lender who retains the first-lien position in this sub-prime mortgage). Between 2004 and 2006 the share of sub-prime mortgages relative to total originations ranged from 18 – 21 per cent, versus less than 10 per cent in 2001-2003 and during 2007. (Perry, 2008) See Figure 5.4.

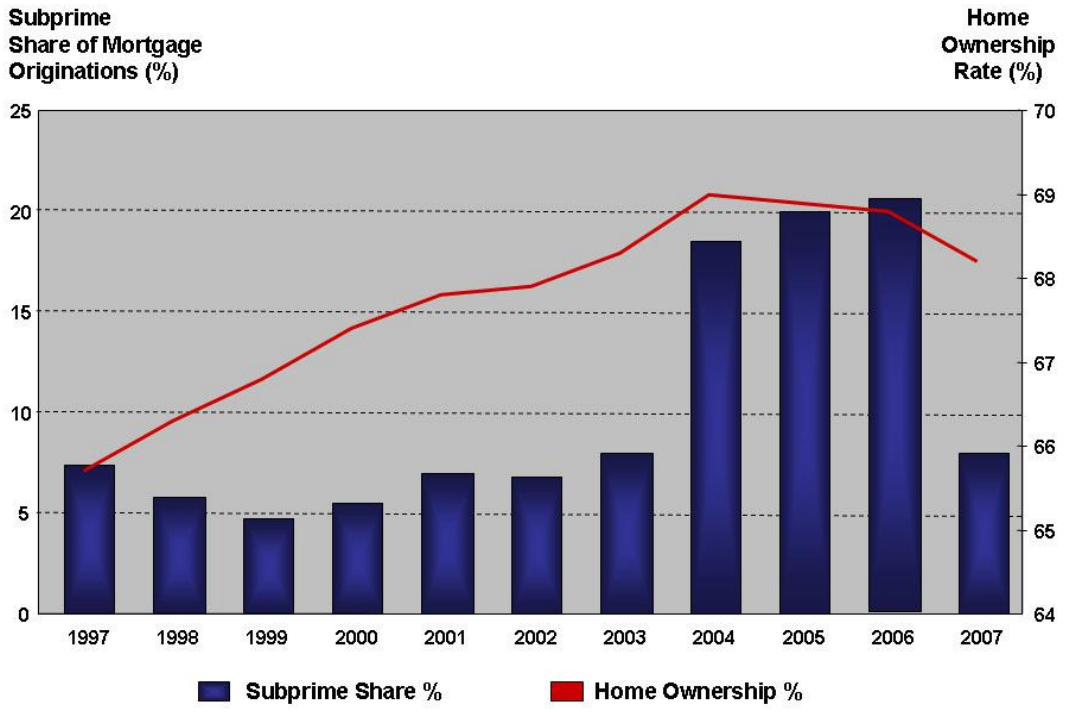


Figure 5.4 U.S. Sub-prime Lending Expanded Significantly 2004-2006
Sources: U.S. Census Bureau; Harvard University – State of the Nation’s Housing Report 2008

Besides the downgraded loan qualifications, some new dangerous financial tools were created, which further increased the vulnerability of the financial system. The adjustable-rate mortgage (ARM) is an example. These mortgages enticed borrowers with a below-market interest rate for some predetermined period, followed by market interest rates for the remainder of the mortgage's term. Borrowers who could not make the higher payments once the initial grace period ended would try to refinance their mortgages. Under this situation, if the housing prices keep going up, borrowers will get more money by refinance their mortgages to pay the increasing interest. But the total amount of money which they borrowed increased and thus the total risks increased.

5.2.2 Huge inflows of foreign funds

The huge inflows of foreign funds to the U.S. provided abundant credit and pushed up the U.S. housing prices. This huge inflow of foreign funds was the result of the vast U.S. trade imbalance. Between 1996 and 2004 the U.S. current account deficit increased by $650 billion, from 1.5 per cent to 5.8 per cent of GDP. Figure 5.5 describes this change.

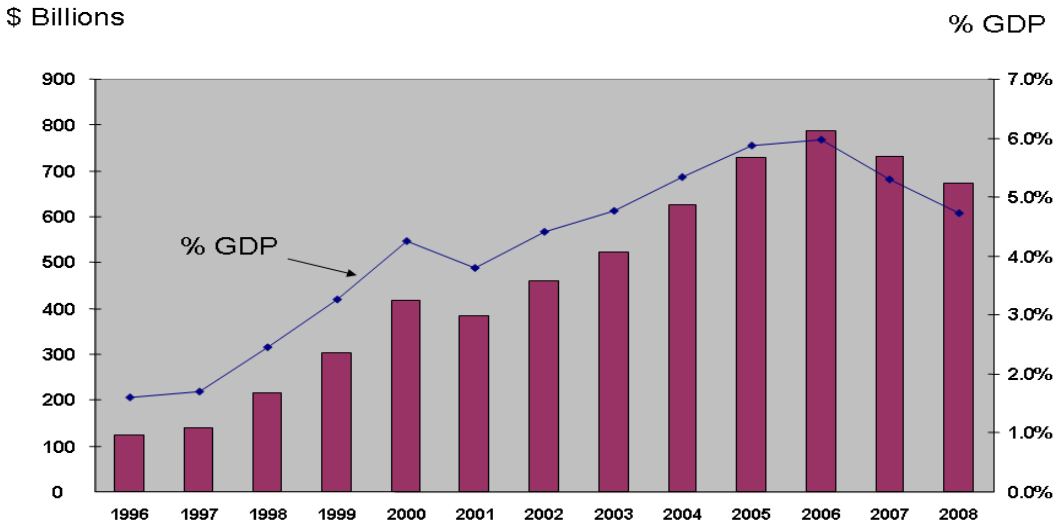


Figure 5.5 U.S. Current Account or Trade Deficit: Dollars and % GDP

Source Data: U.S. Bureau of Economic Analysis (BEA)

According to the balance of payments identity, a country (such as the U.S.) running a current account deficit needs to have a capital account (investment) surplus of the same amount. This is exactly what occurred in the U.S. economy. A great deal of foreign investment, mainly from the emerging economies in Asia and the oil-exporting nations, swarmed into the U.S. After

the Asian financial crisis in 1997, Asian countries realised that they needed to establish a large foreign currency reserve against the next financial crisis. The U.S. dollar was chosen as their main reserve currency. With the huge amount of goods exported to the U.S. and Europe, the official U.S. dollar reserves, as well as private savings which are denominated in U.S. dollars in these Asian countries, increased dramatically. At the same time, the soaring oil price brought the oil-exporting nations billions of U.S. dollars as well. Of course, these U.S. dollars would not remain as cash in the hands of these governments. Most of these U.S. dollars went back to America to buy the safest assets in the world: U.S. treasury bonds. For example, at the end of June 2010, official foreign currency reserves in China amounted to more than U.S. $2 trillion, approximately half of it denominated in U.S. dollars. And with this US$1 trillion, the Chinese government bought about US$800 billion U.S. treasury bonds. Ben Bernanke referred to this as a “saving glut” (Bernanke, 2007). Following this huge foreign investment the U.S. had been changed from a net foreign investment country to a negative foreign investment country. See Figure 5.6.

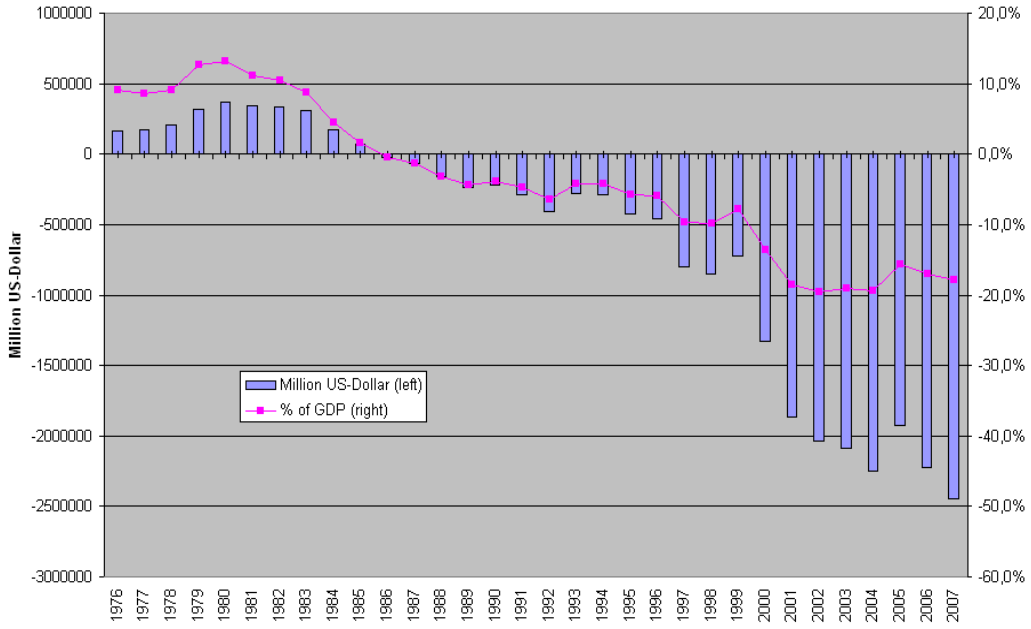


Figure 5.6 U.S.A. Net International Investment Position

Sources: Elena L. Nguyen, *The International Investment Position of the United States at Yearend 2007*, U.S. Bureau of Economic Analysis, July 2008

The huge amount of U.S. treasury bonds bought by foreign governments effectively relieved the tight condition of the U.S. capital market. It prevented long-term interest rates from going up and even, to a large extent, eliminated

the Fed's endeavour to tighten the capital market. If not for these foreign investors, it would have been the American people who would have absorbed all the U.S. treasury bonds. Lower interest rates encourage borrowing and thus this flood of foreign funds indirectly helped the U.S. housing market to keep booming.

But "a bubble is not indefinitely sustainable" (Shiller, 2001). The credit and price explosion led to a new house-building explosion which eventually led to a surplus of housing supply. And to prevent overheating of the economy, the Fed raised the Fed funds rate significantly between July 2004 and July 2006. This contributed to an increase in 1-year and 5-year adjustable-rate mortgage (ARM) rates, making ARM interest rate resets more expensive for homeowners. U.S. housing prices then began to decline, after having peaked in mid-2006.

Following the drop of U.S. housing prices and the interest rates reset, ARM borrowers found it more difficult to refinance their mortgages. The foreclosure rate increased. Foreclosure refers to the process whereby the lender may take possession of the property if a borrower is delinquent in making timely mortgage payments to the loan servicer (a bank or other financial institution). In the third quarter of 2007, sub-prime ARMs, making up only 6.8 per cent of U.S. mortgages outstanding, also accounted for 43 per cent of the foreclosures which began during that quarter. By October 2007, approximately 16 per cent of sub-prime ARMs were either 90-days delinquent or the lender had begun foreclosure proceedings; roughly triple the rate of 2005. By January 2008, the delinquency rate had risen to 21 per cent and by May 2008 it was 25 per cent (Bernanke, 2008).

The value of all outstanding residential mortgages owed by U.S. households in the purchase of residences housing at most four families was US$9.9 trillion as of year-end 2006, and US$10.6 trillion as of midyear 2008. During 2007, lenders had begun foreclosure proceedings on nearly 1.3 million properties, a 79 per cent increase over 2006. This increased to 2.3 million in 2008, an 81 per cent increase vs. 2007, and again to 2.8 million in 2009, a 21 per cent increase vs. 2008. By August 2008, 9.2 per cent of all U.S. mortgages outstanding were either delinquent or in foreclosure. By September 2009, this had risen to 14.4 per cent. Between August 2007 and October 2008, there were 936,439 U.S. residences under foreclosure (Clifford, 2008).

As more borrowers stopped paying their mortgage payments (this became an ongoing crisis) foreclosures and the supply of homes for sale increased. This placed downward pressure on housing prices and by September 2008, average U.S. housing prices had declined by over 20 per cent from their mid-2006 peak. This major and unexpected decline in house price meant that many borrowers had zero or negative equity in their homes, resulting in their homes being worth less than their mortgages. As of March 2008, an estimated 8.8 million borrowers — 10.8 per cent of all homeowners — had negative equity in their homes, a number that is believed to have risen to 12 million by November 2008. Borrowers in this situation have an incentive to default on their mortgages (Andrews & Uchitelle, 2008). Economist Stan Leibowitz (2009) argued in the *Wall Street Journal* that although only 12 per cent of homes had negative equity, they comprised 47 per cent of foreclosures during the second half of 2008. He concluded that the extent of equity in the home was the key factor in foreclosure, rather than the type of loan, credit-worthiness of the borrower, or ability to pay.

A decline in mortgage payments will definitely reduce the value of mortgage-backed securities, and then erode the net worth and financial health of banks which hold these MBSs. Investors lose confidence in the banks once they hear that their banks hold such large amounts of “toxic assets” and they then withdraw their deposits from the banks. Under pressure, the banks will start to sell these problematic assets. But once all banks start to sell at the same time, they will be hit by a “fire sale” situation. All banks selling similar assets will cause the prices of these assets to drop quickly, thus further destroying the investors’ confidence, and further causing banks to have to sell more assets. Feldstein (2008) pointed out that “this vicious cycle is at the heart of the crisis”.

In a “fire sale” situation, banks will not only suffer a very low selling price, but also face the danger that they cannot sell their assets at all, like the problems of Bear Stearns and Lehman Brothers. Reinhart and Rogoff (2009) found that different banks often hold broadly similar portfolios of assets, and if all banks try to sell at the same time, the market can dry up completely. Assets that are relatively liquid during normal times can suddenly become highly illiquid just when the bank most needs them. Thus, even if the bank would be completely solvent absent a run, its balance sheet may be destroyed by having to liquidate assets at “fire sale” prices.

5.3 Shadow Banking System

Compared to other businesses, banks are more vulnerable to failure (and abuse), and the consequences of failure exert a large impact on the economy. Thus banks are required to maintain a fraction of their deposits in the form of cash and other reserves (CFA Institute, 2006). This is called the fractional reserve banking system. But capital is costly, even if it is only a fraction.

To avoid this cost (required deposits have to be deposited with central banks as an insurance, so cannot fully be used by banks, thus these banks see this required deposit as a cost) bankers try to circumvent the regulation by either hiding risk or by moving some leverage outside the bank. In fact, the decrease in the leverage ratio of commercial banks was accompanied by an increase in the leverage ratios of non-banking financial institutions (see the dotted and dashed lines in Figure 5.7) (UNCTAD, 2009:13). This shift of leverage created a “Shadow Banking System”.

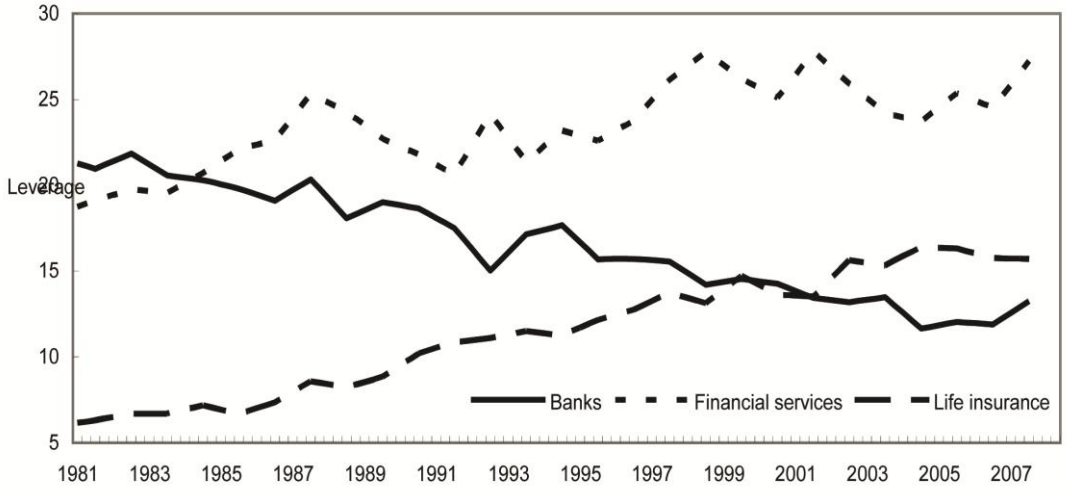


Figure 5.7 Leverages of Top 10 United States Financial Firms by Sector

Source: UNCTAD secretariat calculations, based on balance sheet data from Thomson Datastream.

Note: Leverage ratio measured as share of shareholders equity over total assets. Data refers to 4-quarter moving average.

The shadow banking system consists of non-depository banks and other financial entities (e.g., investment banks, hedge funds, and money market funds). By definition, shadow institutions do not accept deposits like a depository bank and therefore are not subject to the same regulations. Familiar examples of shadow institutions include Bear Stearns and Lehman Brothers.

Other complex legal entities comprising the system include hedge funds, structured investment vehicles (SIVs), conduits, money funds, investment banks, and other non-banking financial institutions.

Shadow banking institutions are typically intermediaries between investors and borrowers. For example, an institutional investor like a pension fund may be willing to lend money, while a corporation may be searching for funds to borrow. The shadow banking institution will channel funds from the investors to the corporation, profiting either from fees or from the difference in interest rates between what it pays the investors and what it receives from the borrower. Many shadow bank-like institutions and vehicles have emerged in American and European markets and have grown dramatically since the year 2000, when they started to play an important role in providing credit across the global financial system. At its peak, the shadow banking system in the United States held assets of more than US$16 trillion, about US$4 trillion more than regulated deposit-taking banks, see Figure 5.8 (UNCTAD, 2009:13).

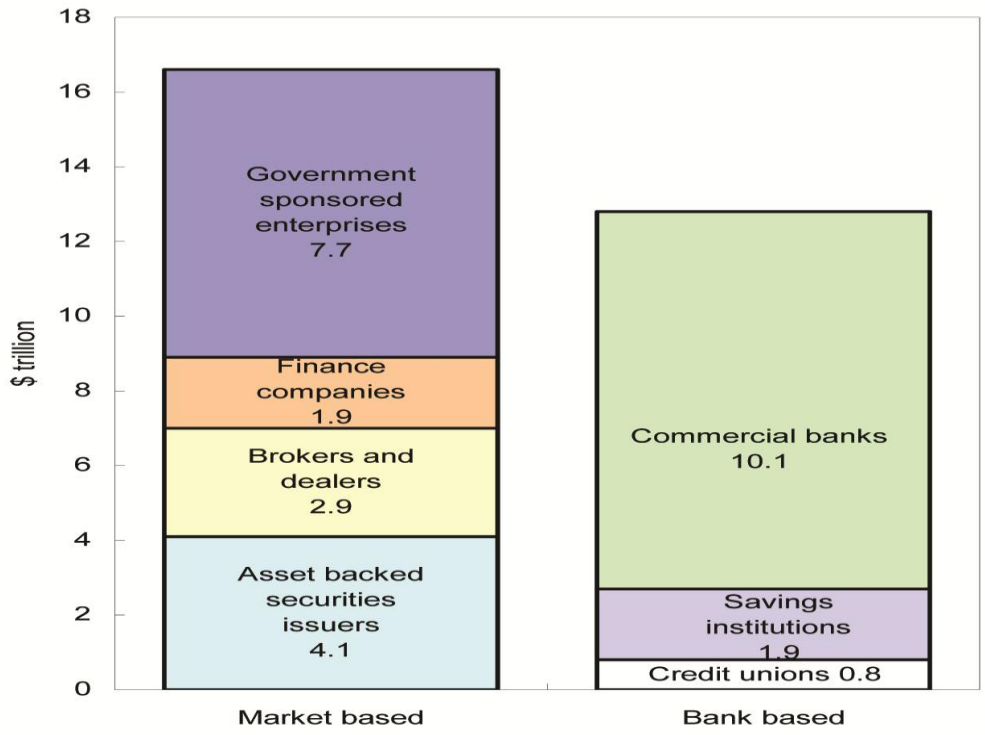


Figure 5.8 The Shadow Banking System, 2007, Q2

Source: Shin (2009), UNCTAD, *The Global Economic Crisis: Systemic Failures and Multilateral Remedies*, 2009.

Shadow institutions are not subject to the same safety and soundness regulations as depository banks, meaning that they do not have to keep as much money in the proverbial vault relative to what they borrow and lend. In

other words, they can have a very high level of financial leverage, with a high ratio of debt relative to the liquid assets available to pay immediate claims. High leverage magnifies profits during boom periods and losses during downturns.

At the beginning, regulators did not seem to be too worried about this problem because they assumed that, unlike deposit-taking banks, the collapse of large non-banking institutions would not have systemic implications. The working hypothesis was that securitisation had contributed to both diversifying and allocating risk to sophisticated economic agents who could bear such risk. As a consequence, the system could now take a higher level of total risk (UNCTAD, 2009:14). But they forgot that the shadow institutions had grown even bigger than the deposit-taking banks at that time.

The current regulatory framework also assumed that policies aimed at guaranteeing the soundness of individual banks could also guarantee the soundness of the whole banking system (Nugee & Persaud, 2006). It was micro-prudential but not macro-prudential. This proved to be problematic because there were instances in which what was prudent for an individual institution had negative systemic implications. Consider the case of a bank that suffers large losses on some of its loans. The prudent choice for this bank is to reduce its lending activities and cut its assets to a level which is in line with its smaller capital base. If the bank in question is small, the system will have no problem in absorbing this reduction in lending. If, however, the bank in question is large, or the losses affect several banks at the same time, the individual bank's attempt to rebuild its capital base will drain liquidity from the system. Less lending by some banks will translate into less funding to other banks, which, if other sources of liquidity are not found, might be forced to cut lending and thus amplify the de-leveraging process and affect investment in fixed capital (UNCTAD, 2009:16).

The shadow banking system started to close down in the spring of 2007 and nearly shut-down completely in the autumn of 2008. More than a third of the private credit markets thus became unavailable as a source of funds (Gelinas, 2009). Paul Krugman, laureate of the Nobel Prize in Economics, described the run on the shadow banking system as the "core of what happened" to cause the crisis. "As the shadow banking system expanded to rival or even surpass conventional banking in importance, politicians and government officials should have realised that they were recreating the kind of financial vulnerability

that made the Great Depression possible and they should have responded by extending regulations and the financial safety net to cover these new institutions. Influential figures should have proclaimed a simple rule: anything that does what a bank does, anything that has to be rescued in crises the way banks are, should be regulated like a bank." He referred to this lack of control as "malign neglect" (Krugman, 2009).

6. Conclusion

We can now conclude what the causes of this global financial crisis were: under the stimulation of seeking more profit, financial institutions expanded to an unreasoned credit size by using the shadow banking system and then induced and amplified the housing bubble. At the same time, the risks spread across the world through the process of securitisation. Finally, the housing bubble burst, and a worldwide financial crisis became inevitable.

On 15 November 2008, leaders of the Group of Twenty (G20) summarised the following causes of the Global Financial Crisis: *"During a period of strong global growth, growing capital flows, and prolonged stability earlier this decade, market participants sought higher yields without an adequate appreciation of the risks and failed to exercise proper due diligence. At the same time, weak underwriting standards, unsound risk management practices, increasingly complex and opaque financial products, and consequent excessive leverage combined to create vulnerabilities in the system. Policy-makers, regulators and supervisors, in some advanced countries, did not adequately appreciate and address the risks building up in financial markets, keep pace with financial innovation, or take into account the systemic ramifications of domestic regulatory actions"* (*G20*, 2008).

This crisis has shown that macroeconomists and central bankers knew less than they thought they did. And regulatory shortcomings have clearly been a key contributory factor to the global financial crisis (Claessens, Dell'Ariccia, Igan & Laeven, 2010). So it requires us to redesign the macroeconomic policy framework and implement the lessons learned from the crisis.

We suggest that the central bank or the national financial supervisor should intensify market regulation and supervision. Dehesa (2007) found that half of the sub-prime mortgage originators are agents and brokers and that they are not part of a banking group; thus, they fall outside federal banking regulation. Moreover, these agents and brokers get paid by commissions based on the

number of mortgage loans that they are able to sell to households, so their incentives have nothing to do with the default risk involved in the loan. On the contrary, the borrower who has higher risk is more difficult to find the buyer, so the borrower is more willing to pay the larger commission to these agents and brokers. The other half of the originators are the banks which, some time ago tended to hold the mortgages for some years on their books, so as to have an incentive to be aware of the risk of non-performing mortgages. But today, both brokers and banks which originate these loans sell them very quickly, either directly or through another financial intermediary, which then securitises and sells them to investors, thus losing their traditional incentive to monitor their risk.

To solve this problem, banking authorities should regulate all the agents and brokers as they regulate the banks. All financial institutions should be supervised on a fully consolidated basis. All markets and providers of financial products should be overseen on the basis of the risk they produce. If an investment bank issues insurance contracts like CDS, this activity should be subject to the same regulation that applies to insurance companies. If an insurance company is involved in maturity transformation, it should be regulated like a bank (Congressional Oversight Panel, 2009). The policy makers can also set an explicit leverage ratio bound to restrain growth of leverage within financial institutions.

We also found that although some risk-hungry investors who were ready to invest in higher-risk-higher-yield financial products like CDOs, encountered the problem that they were not able to fully understand them before purchasing them, because these products were so complex. Thus the banks and financial institutions, which structure and securitise these loans, should be extremely transparent about their package processes, their supporting models and their associated risks (Dehesa, 2007). The rating agencies should also show that they are truly independent and that their rating process is fully transparent and reliable, mainly for these complex structured products.

Central banks and national regulatory authorities around the world should intensify their coordination and communication by reviewing and aligning their global accounting standards; strengthening transparency of credit derivatives markets and reducing their systemic risk (Nanto, 2009). All systemically important financial institutions should be subject to an appropriate degree of regulation. Use of stress-testing by financial institutions should be more

rigorous. Large complex systemically-important financial institutions should be subject to more stringent capital regulation than other firms. Capital decisions by regulators and firms should make greater provision against liquidity risk. Hedge funds should be required to register with a national securities regulator and provide information on a confidential basis to regulators about their strategies and positions (Nanto, 2009). Minimum international standards – a regulatory floor – should apply in all countries, including tax havens and offshore banking centers to avoid regulatory arbitrage.

Central banks and some international financial organisations like the IMF should work more closely to intensify international capital regulation. They should dynamically monitor international financial markets and observe new tendencies of financial innovation. The WTO should play a more active role in balancing global trade; encourage balanced developments in different countries and then mitigate trade imbalances amongst those countries.

All these tasks are not easy and will take a long time to achieve. But if we could realise all these targets, our financial systems would become healthier and a new financial crisis would be less likely to occur. This would be part of Barack Obama's "change" that we can then really believe.

Appendix A
Global Financial Crisis Impact Timeline

2000-2003: Early 2000s recession spurs government action to rev up economy.

2000-2001: US Federal Reserve lowers Federal funds rate 11 times, from 6.5 per cent (May 2000) to 1.75 per cent (December 2001), creating an easy-credit environment that fueled the growth of US subprime mortgages.

2002-2006: Fannie Mae and Freddie Mac combined purchases of incorrectly rated AAA subprime mortgage-backed securities rise from U.S. $38 billion to U.S. $90 billion per year.

- Lenders began to offer loans to higher-risk borrowers; Subprime mortgages amounted to U.S. $600 billion (20 per cent) by 2006.
- Speculation in residential real estate rose. During 2005, 28 per cent of homes purchased were for investment purposes, with an additional 12 per cent purchased as vacation homes. During 2006, these figures were 22 per cent and 14 per cent, respectively. As many as 85 per cent of condominium properties purchased in Miami were for investment purposes which the owners resold without the seller ever having lived in them.

2002-2003: Mortgage denial rate of 14 per cent for conventional home purchase loans, half of 1997.

2002: Annual home price appreciation of 10 per cent or more in California, Florida, and most Northeastern states.

- **June 17:** President G.W. Bush sets goal of increasing minority home owners by at least 5.5 million by 2010 through billions of dollars in tax credits, subsidies and a Fannie Mae commitment of U.S. $440 billion to establish NeighborWorks America with faith based organizations.

2003: Federal Reserve Chair Alan Greenspan lowers Federal Reserve's key interest rate to 1 per cent, the lowest in 45 years.

- **August:** Borio and White of Bank of International Settlements speak at the Jackson Hole Economic Symposium, referencing BIS's "Credit Risk Transfer" 2003 report which warned about problems with collateralized

debt obligations[4] and rating agencies. Their arguments are rejected or ignored by attendees, including Alan Greenspan.

- **September:** Bush administration recommended moving governmental supervision of Fannie Mae and Freddie Mac under a new agency created within the Department of the Treasury. The changes are blocked by Congress.

2003-2007: U.S. subprime mortgages increased 292 per cent, from U.S. $332 billion to U.S. $1.3 trillion, due primarily to the private sector entering the mortgage bond market, once an almost exclusive domain of government sponsored enterprises like Freddie Mac.

- The Federal Reserve fails to use its supervisory and regulatory authority over banks, mortgage underwriters and other lenders, who abandoned loan standards (employment history, income, down payments, credit rating, assets, property loan-to-value ratio and debt-servicing ability), emphasizing instead lender's ability to securitize and repackage subprime loans.

2004-2007: Many financial institutions issued large amounts of debt and invested in mortgage-backed securities[5] (MBS), believing that house prices would continue to rise and that households would keep up on mortgage payments.

2004: U.S. homeownership rate peaks with an all time high of 69.2 per cent.

- Following the example of Countrywide Financial, the largest U.S. mortgage lender, many lenders adopt automated loan approvals that critics argued were not subjected to appropriate review and documentation according to good mortgage underwriting standards. In 2007, 40 per cent of all subprime loans resulted from automated underwriting. Mortgage fraud by borrowers increases.
- U.S. Department of Housing and Urban Development (HUD) ratcheted up Fannie Mae and Freddie Mac affordable-housing goals for next four years, from 50 per cent to 56 per cent, stating they lagged behind the private market; they purchased U.S. $175 billion in 2004—44 per cent of the market; From 2004 to 2006, they purchased U.S. $434 billion in securities backed by subprime loans.[6]
- **October:** SEC effectively suspends net capital rule for five firms — Goldman Sachs, Merrill Lynch, Lehman Brothers, Bear Stearns and Morgan Stanley. Freed from government imposed limits on the debt they

can assume, they levered up 20, 30 and even 40 to 1, buying massive amounts of mortgage-backed securities and other risky investments.

2005:

- The Securities and Exchange Commission ceases an investigation of Bear Stearns "pricing, valuation, and analysis" of mortgage-backed collateralized debt obligations. No action is taken against Bear.
- Robert Shiller gives talks warning about a housing bubble to the Office of the Comptroller of the Currency and the Federal Deposit Insurance Corporation. He is ignored, and would later call it an incidence of Groupthink. That same year, his second edition of "Irrational Exuberance" warns that the housing bubble might lead to a worldwide recession.

January:

- Federal Reserve Governor Edward Gramlich raises concerns over subprime lending practices, says mortgage brokers might not have incentives for careful underwriting and that that portion of the subprime industry was veering close to a breakdown, that it's possible that it is a bubble but that the housing market did not qualify for specific monetary policy treatment at this point.
- The Bank of International Settlements warns about the problems with structured financial products, and points out the conflict of interest of credit rating agencies – that they are being paid by the same companies they are supposed to be objectively evaluating.

February: The Office of Thrift Supervision implements new rules that allow savings and loans with over U.S. $1 billion in assets to meet their CRA[7] obligations without investing in local communities, cutting availability of subprime loans.

June: The International Swaps and Derivatives Association enables credit default swaps[8] (quasi-insurance contracts) to be taken out against asset-backed security collateralized debt obligations (including ones backed by subprime mortgages).

August: Raghuram Rajan delivers his paper "Has Financial Development Made the World Riskier?" warning about credit default swaps, at the Jackson Hole Economic Symposium. His arguments are rejected by attendees, including Alan Greenspan, Donald Kohn, and Lawrence Summer.

September: The Mortgage insurance companies of America send a letter to the Federal Reserve, warning about “risky lending practices’ on US real estate.

Fall 2005: Booming housing market halt abruptly, from the fourth quarter of 2005 to the first quarter of 2006, median prices nationwide drop 3.3 per cent.

2006:

- **May:** The subprime lender Ameriquest announces it will cut 3,800 Jobs, close its 229 retail branches and rely instead on the Web.
- **May 5:** Merit Financial Inc, based in Kirkland, Washington, files for bankruptcy and closes its doors, firing all but 80 of its 410 employees; Merit’s marketplace decline about 40 per cent and sales are not bringing in enough revenue to support overhead.
- **August:** U.S. Home Construction Index is down over 40 per cent as of mid-August 2006 compared to a year earlier.
- **August 26:** Defaults on subprime mortgages start to occur much earlier in the mortgage process. Investors and analysts believe this trend could be the result of lax underwriting quality or a sign of a weakening mortgage credit market.
- **September 7:** Nouriel Roubini warns the International Monetary Fund about a coming US housing bust, mortgage-backed securities failures, bank failures, and a recession. His work was based partly on his study of recent economic crises in Russia (1998), Argentina (2000), Mexico (1994), and Asia (1997).
- **Fall 2006:** J.P. Morgan CEO Jamie Dimon directs the firm to reduce its exposure to subprime mortgages.
- **December 2006:** Goldman-Sachs claims after the fact that it began reducing its exposure to subprime mortgages at this point. It also begins increasing its short positions. Others claim these risk decisions were made in the spring and summer 2007.
- Lenders make U.S. $640 billion in subprime loans, 20 per cent of all mortgage lending was subprime.

2007:

Home sales continue to fall. The plunge in existing-home sales is the steepest since 1989. In Q1/2007, S&P/Case-Shiller house price index records first year-over-year decline in nationwide house prices since 1991. The subprime mortgage industry collapses, and a surge of foreclosure activity (twice as bad

as 2006) and rising interest rates threaten to depress prices further as problems in the subprime markets spread to the near-prime and prime mortgage markets.

- **January 3:** Ownit Mortgage Solutions Inc. files for Chapter11. Records show that Ownit Mortgage Solutions owed Merrill Lynch around U.S. $93 million at the time of filing.
- **February 5:** Mortgage Lenders Network USA Inc., the country's 15th largest subprime lender with U.S. $3.3 billion in loans funded in third quarter 2006, files for Chapter 11.
- **February 7:** HSBC, a large London based bank, issues a warning that an earlier statement about its Mortgage Services operations will be much worse than current market estimates.
- **February 10:** The Group of Seven Finance Ministers meet in Essen, Germany to discuss worldwide financial problems. One of the main concerns is the lack of regulation of hedge funds. Germany says this could be a source of systematic risk for the financial system where the US believed market discipline is the best way to address the issue.
- **February-March:** Subprime industry collapse; several subprime lenders declaring bankruptcy, announcing significant losses, or putting them up for sale. These include Accredited Home Lenders Holding, New Century Financial, DR Horton and Countrywide Financial.
- **March:** The value of USA subprime mortgage was estimated at U.S. $1.3 trillion as of March 2007.
- **March 6:** In a speech before the Independent Community Bankers of America's Annual Convention and Techworld, Honolulu, Hawaii, Ben Bernanke, quoting Alan Greenspan, warns that the Government Sponsored Enterprises (GSEs), Fannie Mae and Freddie Mac, were a source of "systemic risk" and suggest legislation to head off a possible crisis.
- **April 3:** New Century Financial, largest U.S. subprime lender, files for chapter 11 bankruptcy, cuts 54 per cent of its workforce or 3,200 jobs.
- **April 12:** SouthStar Funding LLC files for chapter 7.
- **April 24:** U.S. total house sales reduce 8.4 per cent in March.
- **June 7:** Bear Stearns & Co informs investors in two of its funds, the High-Grade Structured Credit Strategies Enhanced Leverage Fund and the High-Grade Structured Credit Fund that it was halting redemptions because of liquidity problems.[9]

- **June 20:** Merrill Lynch seized U.S. $800 million in assets from Bear Stearns hedge funds that were involved in securities backed by subprime loans.
- **June 25:** FDIC Chair Shelia Bair cautioned against the more flexible risk management standards of the Basel II international accord and lowering bank capital requirements generally: "There are strong reasons for believing that banks left to their own devices would maintain less capital -- not more -- than would be prudent. The fact is, banks do benefit from implicit and explicit government safety nets...In short, regulators can't leave capital decisions totally to the banks."
- **June 27:** SEC Chairman, Christopher Cox, testifies to Congress that the SEC has opened 12 enforcement investigations into collateralized debt obligation (CDO) practices. This was in response to questions from Congress about the transparency of CDOs.
- **July 6:** UBS fires CEO and the heir apparent for chairman of the board, Peter Wuffi.
- **July 9:** Credit Suisse releases a report that shows CDO losses could total up to U.S. $52 billion.
- **July 10:** The Federal Reserve reports that consumer credit debt rose at an annual rate of 6.4 per cent, the biggest jump in six months. This was close to double what analysts were expecting.
- **July 17:** In a letter sent to investors, two Bear Stearns hedge funds specializing in subprime debt announce that each fund has lost at least 90 per cent of its value. Bear Stearns declined to provide more liquidity following the U.S. $3.2 billion given as a bailout in June 2007 to cover margin calls. The total of investor contributions to the funds was around U.S. $1.6 billion. AAA tranches of subprime debt were the only rating investing in by the funds.
- **July 19:** Dow Jones industrial Average closes above 14,000 for the first time in its history.
- **July 24:** Countrywide Financial announces that second quarter profits were down 33 per cent.
- **August:** worldwide "credit crunch" as subprime mortgage backed securities are discovered in portfolios of banks and hedge funds around the world, from BNP Paribas to Bank of China. Many lenders stop offering home equity loans and "stated income" loans.[10] Federal Reserve injects

about U.S. $100 billion into the money supply for banks to borrow at a low rate.

- **August 3:** A German government-led bailout of IKB Deutsche Industriebank results in state-owned Kfw assuming up to €1 billion in expected possible losses. Kfw and other banks agreed to guarantee a liquidity line of up to €8.1 billion to cover the loss in value of the bank's subprime US investments.
- **August 6:** American Home Mortgage Investment Corporation (AHMI) files chapter11 bankruptcy. The company expects to see up to a U.S. $60 million loss for the first quarter 2007.
- **August 7:** Numerous quantitative long/short equity hedge funds suddenly begin experiencing unprecedented losses as a result of what is believed to be liquidations by some managers' eager to access cash during the liquidity crisis. It highlights one of the first examples of the contagion effect of the subprime crisis spilling over into a radically different business area.
- **August 9:** French investment bank BNP Paribas suspends three investment funds that invested in subprime mortgage debt, due to a "complete evaporation of liquidity" in the market. The bank's announcement is the first of many credit-loss and write-down announcements by banks, mortgage lenders and other institutional investors, as subprime assets went bad, due to defaults by subprime mortgage payers. This announcement compels the intervention of the European Central Bank, pumping 95 billion Euros into the European banking market.
- **August 10:** Central banks coordinate efforts to increase liquidity for first time since the aftermath of the September 11, 2001 terrorist attacks. The United States Federal Reserve (Fed) injects a combined 43 billion USD, the European Central Bank (ECB) 156 billion euros (214.6 billion USD), and the Bank of Japan 1 trillion Yen (8.4 billion USD). Smaller amounts come from the central banks of Australia, and Canada.
- **August 14**: Sentinel Management Group suspends redemptions for investors and sells off U.S. $312 million worth of assets; three days later Sentinel files for Chapter 11 bankruptcy protection. US and European stock indices continue to fall.
- **August 15:** The stock of Countrywide Financial, which is the largest mortgage lender in the United States, falls around 13 per cent on the New

York Stock Exchange after Countrywide says foreclosures and mortgage delinquencies have risen to their highest levels since early 2002.

- **August 16:** Countrywide Financial Corporation, the biggest U.S. mortgage lender, narrowly avoids bankruptcy by taking out an emergency loan of U.S. $11.5 billion from a group of banks. Fitch drops Countrywide to BBB+ and Moody's drops to Baa3.
- **August 17:** The Federal Reserve cuts the discount rate by half a percent to 5.75 per cent from 6.25 per cent while leaving the federal funds rate unchanged in an attempt to stabilize financial markets.
- **August 26:** Landesbank Baden-Württemberg (LBBW), the German public sector bank, agrees to buy Sachsen Landesbank for €250 million. Sachsen LB is the second German bank that needed to be bailed out.
- **August 28:** The National Association of Realtors (NAR) reports that the supply of unsold homes in the US was at its highest in sixteen years in July.
- **August 31:** President Bush announces a limited bailout of U.S. homeowners unable to pay the rising costs of their debts. Ameriquest, once the largest subprime lender in the U.S., goes out of business.
- **September 1-3:** Fed Economic Symposium in Jackson Hole, WY addressed the housing recession that jeopardizes U.S. growth. Several critics argue that the Fed should use regulation and interest rates to prevent asset-price bubbles, blamed former Fed-chairman Alan Greenspan's low interest rate policies for stoking the U.S. housing boom and subsequent bust, and Yale University economist Robert Shiller warned of possible home price declines of fifty percent.
- **September 4:** The Libor rate rises to its highest level since December 1998, at 6.7975 per cent, above the Bank of England's 5.75 per cent base rate.
- **September 6:** The Federal Reserve adds U.S. $31.25 billion in temporary reserves (loans) to the US money markets which has to be repaid in two weeks.
- **September 7:** US Labor Department announces that non-farm payrolls fell by 4,000 in August 2007, the first month of negative job growth since August 2003, due in large part to problems in the housing and credit markets.
- **September 14:** The Bank of England extends emergency funding to Northern Rock, a large British mortgage lender. The move came after investors withdrew support of Northern Rock amid worries that the

institution could face short term difficulties in raising the needed capital in the wholesale market.

- **September 17:** Former Fed Chairman Alan Greenspan said “we had a bubble in housing” and warns of “large double digit declines” in home values “larger than most people expect.”
- **September 18:** The Fed lowers interest rates by half a point (0.5 per cent) in an attempt to limit damage to the economy from the housing and credit crises.
- **September 26:** The Bank of England announces an auction of £10 billion of emergency three-month funds at 6.75 per cent and agrees to accept mortgages from banks as collateral. This was an attempt to provide the much needed liquidity to the banking system in England but they received no bids.
- **September 30:** Affected by the spiraling mortgage and credit crises, Internet banking pioneer NetBank goes bankrupt, and the Swiss bank UBS announces that it lost U.S. $690 million in the third quarter. After the announcement, the chief executive of its investment banking division, Huw Jenkins was replaced.
- **October 3:** Morgan Stanley cuts 600 jobs. This amounted to 1 per cent of its workforce.
- **October 5:** Merrill Lynch announces a U.S. $5.5 billion loss as a consequence of the subprime crisis, which is revised to U.S. $8.4 billion on October 24, a sum that credit rating firm Standard & Poor’s called “startling”.
- **October 11:** There are currently U.S. $350 billion in the adjustable-rate mortgages (ARMs) in the US marketplace. Record levels of foreclosures are expected to worsen as the ARMs reset to higher interest rates. RealtyTrac, which keeps housing data, releases a report that says foreclosures in the US housing market have doubled in September compared to the same time last year. The number of foreclosures is actually down 8 per cent from August.
- **October 16:** Citigroup’s profits drop 57 per cent from the same quarter last year. Write downs linked to subprime mortgages, which totaled over U.S. $3 billion, are blamed for the drop.
- **October 15-17:** A consortium of U.S. banks backed by the U.S. government announces a "super fund" of U.S. $100 billion to purchase mortgage-backed securities whose mark-to-market value plummeted in the

subprime collapse. Both Fed chairman Ben Bernanke and Treasury Secretary Hank Paulson express alarm about the dangers posed by the bursting housing bubble; Paulson says "the housing decline is still unfolding and I view it as the most significant risk to our economy. … The longer housing prices remain stagnant or fall, the greater the penalty to our future economic growth."

- **October 17:** Morgan Stanley cuts another 300 bankers[11] in its credit trading, structured products, and leveraged lending areas. This resulted from a worldwide freeze in activities in the global credit markets.
- **October 25:** Merrill Lynch announces a U.S. $2.24 billion loss in the third quarter. This was mainly from the U.S. $7.9 billion in write downs on CDOs and subprime mortgages.
- **October 26:** Countrywide Financial reports first loss in 25 years, third quarter loss of U.S. $1.2 billion on about U.S. $1 billion in write downs.
- **October 31:** Merrill Lynch (ML) CEO, Stan O'Neal, resigns after an announcement that ML would write down around U.S. $7.9 billion debt caused by their exposure to the subprime mortgage market. O'Neal is offered U.S. $160 million payout from ML to leave.
- **October 31:** Federal Reserve lowers the federal funds rate by 25 basis points to 4.5 per cent.
- **November 1:** Federal Reserve injects U.S. $41 billion into the money supply for banks to borrow at a low rate. The largest single expansion by the Fed since U.S. $50.35 billion on September 19, 2001.
- **November 5:** Citigroup CEO, Chuck Prince, resigns after an announcement that Citigroup may have to write down up to U.S. $11 billion in bad debt from losses in the subprime mortgage crisis.
- **November 13:** Bank of America says it will have to write off U.S. $3 billion of bad debt. The bank also said it will spend U.S. $600 million supporting some of its funds because of possible liquidity problems.
- **November 15:** Barclays confirms a U.S. $1.6 billion write down in the month of October on their subprime holdings. The bank also released that more than £5 billion in exposure to subprime loan packages could lead to more write downs in the future.
- **November 15:** Financial Accounting Standards Board "Fair Value Measurements" standards upgrade the quality of financial reporting through greater transparency. However, this "mark-to-market" accounting

may exaggerate the loss in value of an asset, as shown on balance sheets, and trigger a cascade of unnecessary financial losses.

- **November 21:** Freddie Mac announces a U.S. $2 billion loss in mortgage defaults and credit losses. Shares in Freddie Mac dropped 28.7 per cent and Fannie Mae dropped 24.8 per cent upon the announcement.
- **November 23:** Two French banks pledge U.S. $1.5 billion to bailout French bond insurer CIFG.
- **November 27:** Citigroup raises U.S. $7.5 billion from Abu Dhabi government. Freddie Mac announces a U.S. $6 billion share issue to cover more losses from mortgages. Kfw, a German state-owned bank, doubled its balance sheet risk provisions from their bailout of IKB to €4.8 billion in expected losses.
- **November 29:** The Nationwide building society announces that UK housing prices fell by 0.8 per cent in November, the largest drop in 12 years. The Bank of England releases data that mortgage approvals fell to their lowest level since 2005 in October. This data is starting to reveal the slowdown in the UK housing market.
- **December 6:** President Bush announces a plan to voluntarily and temporarily freeze the mortgages of a limited number of mortgage debtors holding adjustable rate mortgages (ARM). He also asked Members of Congress to: 1. Pass legislation to modernize the FHA. 2. Temporarily reform the tax code to help homeowners refinance during this time of housing market stress. 3. Pass funding to support mortgage counseling. 4. Pass legislation to reform Government Sponsored Enterprises (GSEs) like Freddie Mac and Fannie Mae.
- **December 10:** UBS announces U.S. $10 billion more in write downs associated with their subprime holdings.
- **December 12:** The Fed created a Term Auction Facility (TAF) designed to allow banks to get Fed funds by pledging all sorts of collateral. The TAF is open to all depository institutions judged to be in sound financial condition. TAF is designed to provide more liquidity to the ailing credit markets. The Federal Open Market Committee also approved swap agreements (reciprocal currency arrangements) which will provide U.S. $20 billion to the European Central Bank and U.S. $4 billion to the Swiss National Bank. These swap lines were approved for up to six months. The coordinated effort by the world's central banks to inject liquidity into the financial system was agreed upon at the G-20 meeting, a meeting of the world's twenty

largest economies, last month in Cape Town. The outlines of the responses were derived at the G-20 meeting and the central banks had stayed in close contact with each other and were pushed into action as the markets deteriorated last week.

- **December 18:** The European Central Bank allocates U.S. $502 billion to banks at a below market interest rate to ease the credit crisis. The aim is to inject liquidity in the market and cut the cost of lending between commercial and retail banks. The ECB was one of five central banks to inject liquidity into the market.
- **December 19:** Morgan Stanley announces U.S. $9.4 billion in write downs from subprime losses. To cover the write downs, Morgan Stanley received a capital injection from a Chinese sovereign wealth fund of U.S. $5 billion.

2008:

Starting in late 2007, and throughout 2008, the 'monoline' municipal bond insurance companies, such as AMBAC, MBIA, and ACA, have their credit ratings downgraded by the credit rating agencies because they had also gotten 'insurance' policies (via credit default swaps) on mortgage-based CDOs. Since the entire 'municipal bond insurance' business model depends on the insurer having a very high credit rating, these companies begin to collapse, and the value of many of the bonds they insured also falls.

- **January 2-21:** January 2008 stock market downturn.
- **January 9:** The Global Economic Prospects study released by the World Bank predicts the worldwide economy will grow at 3.3 per cent (in dollar terms) in 2008. The bank estimates that the US will grow at 2.2 per cent and emerging markets' strong growth will help dampen the downturn effects of the credit crisis on the worldwide economy.
- **January 21:** Global stock markets in London and Europe suffer the biggest one day loss since September 11, 2001. The FTSE 100 index falls 5.5 per cent wiping out £76 billion in market value as investors sell off equity for the safety of government bonds.
- **January 22:** A new panic in the global credit market leads the Fed to cut interest rates by 75 basis points. This is the largest cut in over two decades.
- **January 24:** The National Association of Realtors (NAR) announces that 2007 had the largest drop in existing home sales in 25 years, and "the first

price decline in many, many years and possibly going back to the Great Depression."

- **January 24:** Bush and Congress agree on a U.S. $150 billion economic stimulus plan to save the US economy from slipping into a recession. The package included sending tax refund checks from U.S. $300 to U.S. $1,200 to over 117 million American families. Also included was a lifting of the mortgage purchase limit of Fannie Mae and Freddie Mac from $417,000 to $625,000.[12]
- **February 13:** Data from the Financial Services Agency (FSA), the Japanese financial watchdog, shows that losses from the Japanese exposure to the subprime crisis reached U.S. $5.6 billion in 2007. Of the U.S. $5.6 billion in write downs, more than half came from the last three months of 2007.
- **February 17:** Britain announces the nationalization of Northern Rock. Northern Rock owed the Bank of England £25 billion in loans after a run on the bank last September.
- **February 28:** AIG announces a U.S. $5.2 billion loss for the fourth quarter of 2007, the second consecutive quarter of losses.
- **March 3:** UK's largest bank, HSBC, reports a U.S. $17.2 billion loss on write downs of its US mortgage portfolio.
- **March 5:** France's largest retail bank, Credit Agricole, announces a €857 million loss after write downs of €3.3 billion on its exposure to the credit crisis.
- **March 6:** A £1 billion hedge fund controlled by Peloton Partners collapses. The ABS Master Fund returned an 87 per cent growth rate last year but was unable to meet interest payments on loans taken out as a result of the credit crunch.
- **March 10:** Dow Jones Industrial Average at the lowest level since October 2006, falling more than 20 per cent from its peak just five months prior.
- **March 16:** Bear Stearns is acquired for U.S. $2 a share by JPMorgan Chase in a fire sale avoiding bankruptcy. The deal is backed by the Federal Reserve, providing up to U.S. $30B to cover possible Bear Stearn losses.
- **April 7:** Chief executive of KfW, Ingrid Matthaus-Maier, resigns because of health reasons. KfW bailed out troubled German bank IKB in August 2007 and the original bailout of €1 billion had turned into €7.2 billion as new losses from IKB's exposure to the US subprime market were realized.

- **April 8:** The International Monetary Fund releases its Global Stability Report. The new estimate on credit crunch losses is projected upwards to U.S. $945 billion.
- **April 9:** Washington Mutual, the largest savings and loans bank in the US, announces it will raise U.S. $7 billion from outside investors to cover losses arising from its subprime mortgage.
- **April 14:** Wachovia announces plans to raise U.S. $7 billion in capital after reporting a first quarter loss of U.S. $393 million.
- **May 6:** UBS AG Swiss bank announces plans to cut 5500 jobs by the middle of 2009.
- **May 13:** The Financial Times releases a write downs table showing the worldwide bank write off totaling almost U.S. $450 billion since January 2007.
- **May 21:** A Financial Times investigation uncovered that Moody's awarded an incorrect AAA rating to billions of dollars of complex debt products.
- **June 5:** NY Attorney General, Andrew Cuomo announces rating agency reform agreements with S&P, Moody's, and Fitch.
- **June 16:** The SEC announces plans to overhaul the credit rating agency regulation to increase competition and remove the conflict of interests between the agencies and the investment banks.
- **June 19:** Former Bear Stearns hedge fund managers were arrested, bringing about the first criminal charges in the credit crisis. The charges included securities fraud and insider trading.
- **July 1:** The Treasury in England announces new legislation covering financial stability, failing banks, and depositor protection in an attempt to avoid another Northern Rock situation. The new guarantee scheme raises the deposits covered from £35,000 to £50,000.
- **July 11:** Indymac Bank, a subsidiary of Independent National Mortgage Corporation (Indymac), is placed into the receivership of the FDIC by the Office of Thrift Supervision. It was the fourth-largest bank failure in United States history, and the second-largest failure of a regulated thrift. Before its failure, IndyMac Bank was the largest savings and loan association in the Los Angeles area and the seventh-largest mortgage originator in the United States.
- **July 14:** The rescue plan to save Freddie Mac and Fannie Mae proposed by Henry Paulson. The government said that it will approach Congress for the authority to give unlimited funds to make sure that Fannie Mae and

Freddie Mac do not fail. The Federal Reserve announced it will provide Freddie and Fannie emergency funds on the same terms as banks should it become necessary.

- **July 16:** One of Spain's largest property companies, Martinsa-Fadesa, files for bankrupty.
- **July 17:** Major banks and financial institutions had borrowed and invested heavily in mortgage backed securities and reported losses of approximately U.S. $435 billion as of 17 July 2008.
- **July 29:** U.S. home prices drop 15.8 per cent in May according to Standard & Poor's index reports. This is the steepest one month drop since the index was started eight years ago — eclipsing the 15.3 per cent drop in April.
- **July 30:** President Bush signs into law the Housing and Economic Recovery Act of 2008, which authorizes the Federal Housing Administration[13] to guarantee up to U.S. $300 billion in new 30-year fixed rate mortgages for subprime borrowers if lenders write-down principal loan balances to 90 per cent of current appraisal value.
- **July 31:** Deutsche Bank reveals more write downs bringing the total so far to U.S. $7.8 billion for this year. Nationwide Building Society in the U.K. releases data showing a drop in monthly housing prices of 8.1 per cent compared to July of last year.
- **August 7:** U.K. housing prices fell 11 per cent from January to July 2008.
- **August 11:** A Moody's report shows that U.K. subprime defaults jump. This report shows that the default rate on U.K. subprime mortgages increased from 7.3 per cent in the second quarter of 2007 to 10 per cent in the second quarter of 2008.
- **August 13:** U.K. inflation rate exceeds the bank interest rate for the first time in twenty-seven years.
- **September 7:** Federal takeover of Fannie Mae and Freddie Mac, which at that point owned or guaranteed about half of the U.S.'s $12 trillion mortgage market, effectively nationalizing them. This causes panic because almost every home mortgage lender and Wall Street bank relied on them to facilitate the mortgage market and investors worldwide owned U.S. $5.2 trillion of debt securities backed by them.
- **September 14:** Merrill Lynch is sold to Bank of America amidst fears of a liquidity crisis and Lehman Brothers collapse.
- **September 15:** Lehman Brothers files for bankruptcy protection.

- **September 16:** Moody's and Standard and Poor's downgrade ratings on AIG's credit on concerns over continuing losses to mortgage-backed securities, sending the company into fears of insolvency. In addition, the Reserve Primary Fund "breaks the buck" leading to a run on the money market funds.[14] Over U.S. $140 billion is withdrawn vs. U.S. $7 billion the week prior. This leads to problems for the commercial paper market, a key source of funding for corporations, which suddenly could not get funds or had to pay much higher interest rates.[15]
- **September 17:** The U.S. Federal Reserve lends $85 billion to American International Group (AIG) to avoid bankruptcy.
- **September 18:** Treasury Secretary Henry Paulson and Fed Chairman Ben Bernanke meet with key legislators to propose a $700 billion emergency bailout through the purchase of toxic assets. Bernanke tells them: "If we don't do this, we may not have an economy on Monday." Central banks from around the world announce U.S. $180 billion emergency injection to provide liquidity and halt the escalating crisis. This was in response to the lack of lending between banks that had occurred in the U.S. and U.K. following the AIG bailout.
- **September 19:** The Russian stock market gains 30 per cent after having trading suspended for two days. This was in response to a government pledge of more than U.S. $100 billion in liquidity to help the credit squeeze. The US Treasury announces it will insure money market funds in an attempt to prevent a run on the funds. U.S. President, George W. Bush, approved use of up to U.S. $50 billion from the Exchange Stabilization Fund to insure the holdings of any publicly offered money market mutual fund. Henry Paulson urges Congress to pass legislation that will allow the government to buy toxic mortgage securities from the banks. The proposal will give the Treasury authority to purchase up to U.S. $700 billion of the troubled assets by issuing Treasury securities. The chairman of the Treasury, Mr. Paulson, will have the discretion to determine the timing and scale of the purchases.
- **September 21:** The Russian finance ministry announces it will provide U.S. $24.21 billion in additional funds to the banking system in the form of three-month bonds.
- **September 22:** Goldman Sachs and Morgan Stanley are approved by the Federal Reserve to become bank holding companies which subjects them to regulation by the Fed.

- **September 24:** Goldman Sachs announces it will receive a U.S. $5 billion capital infusion from Warren Buffett's company Berkshire Hathaway.
- **September 25:** Washington Mutual is seized by the Federal Deposit Insurance Corporation, and its banking assets are sold to JP Morgan Chase for U.S. $1.9 billion. This is the biggest bank failure in U.S. history. The U.K. government nationalizes Bradford & Bingley (B&B) after retail savers withdraw tens of millions of pounds in recent days.
- **September 29:** The U.S. House of Representatives votes against the U.S. $700 billion bailout bill proposed by the Treasury. Citigroup agrees to buy the banking operations of Wachovia, the sixth largest lender in the U.S. for U.S. $2.2 billion. The European Central Bank along with the governments of the Netherlands, Belgium, and Luxemburg agree to nationalize Fortis, the European banking and insurance giant. One of Germany's biggest lenders, Hypo Real Estate (HRE), had to be rescued by the German government and other banks after a €50 billion liquidity crisis. The government of Iceland takes control of Glitnir, the country's third largest bank. Mitsubishi UFJ invests U.S. $9 billion in Morgan Stanley in exchange for a 21 per cent share of the company.
- **September 30:** Dexia, a Franco-Belgian bank specializing in local authority finance, gets a €6.4 billion capital injection from various European governments.

  The Securities and Exchange Commission (SEC) issues a clarification on fair value accounting. US Treasury changes tax law to allow a bank acquiring another to write off all of the acquired bank's losses for tax purposes.
- **October 1:** The U.S. Senate passes HR1424, their version of the U.S. $700 billion bailout bill.[16] The financial crisis spreads to Europe.
- **October 3:** President George W. Bush signs the Emergency Economic Stabilization Act, creating a U.S. $700 billion Troubled Assets Relief Program to purchase failing bank assets. It contains also easing of the accounting rules that forced companies to collapse because of the existence of toxic mortgage-related investments. Also key to winning GOP[17] support was a decision by the Securities and Exchange Commission to ease mark-to-market accounting rules that require financial institutions to show the deflated value of assets on their balance sheets.
- **October 3:** Using tax law change made September 30, Wells makes a higher offer for Wachovia, scooping it from Citigroup.

- **October 6-10:** Worst week for the stock market in 75 years. The Dow Jones loses 22.1 per cent, its worst week on record, down 40.3 per cent since reaching a record high of 14,164.53 October 9, 2007. The Standard & Poor's 500 index loses 18.2 per cent, its worst week since 1933, down 42.5 per cent in since its own high October 9, 2007.
- **October 6:** Fed announces that it will provide U.S. $900 billion in short-term cash loans to banks.
- **October 7:** Fed makes emergency move to lend around U.S. $1.3 trillion directly to companies outside the financial sector.
- **October 7:** The Internal Revenue Service (IRS) relaxes rules on US corporations repatriating money held oversees in an attempt to inject liquidity into the US financial market. The new ruling allows the companies to receive loans from their foreign subsidiaries for longer periods and more times a year without triggering the 35 per cent corporate income tax.
- **October 8:** Central banks in U.S.A. (Fed), England, China, Canada, Sweden, Switzerland and the European Central Bank cut rates in a coordinated effort to aid world economy.

  Fed also reduces its emergency lending rate to banks by half a percentage point, to 1.75 per cent.

  White House considers taking ownership stakes in private banks as a part of the bailout bill. Warren Buffett and George Soros criticized the original approach of the bailout bill.

  The UK government launches a £400 billion rescue plan to help restore confidence in the financial markets.
- **October 11:** The Dow Jones Industrial Average caps its worst week ever with its highest volatility day ever recorded in its 112 year history. Over the last eight trading days, the DJIA has dropped 22 per cent amid worries of worsening credit crisis and global recession. Paper losses now on U.S. stocks now total U.S. $8.4 trillion from the market highs last year.

  The G7, a group of central bankers and finance ministers from the Group of Seven leading economies, meet in Washington and agree to urgent and exceptional coordinated action to prevent the credit crisis from throwing the world into depression. The G7 did not agree on the concrete plan that was hoped for.
- **October 13:** European Union leaders meet in Paris to coordinate efforts to combat Europe's credit crisis. French President, Nicolas Sarkozy, pledges €360 billion in liquidity to French banks. The U.K. government starts the

nationalization process by injecting £37 billion in the nation's three largest banks. The U.K. government will end up owning a majority share in the Royal Bank of Scotland (RBS) and over a 40 per cent share in Lloydes and HBOS.

- **October 14:** The U.S. taps into the U.S. $700 billion available from the Emergency Economic Stabilization Act and announces the injection of U.S. $250 billion of public money into the U.S. banking system. The form of the rescue will include the U.S. government taking an equity position in banks that choose to participate in the program in exchange for certain restrictions such as executive compensation. Nine banks agreed to participate in the program and will receive half of the total funds: 1) Bank of America, 2) JPMorgan Chase, 3) Wells Fargo, 4) Citigroup, 5) Merrill Lynch, 6) Goldman Sachs, 7) Morgan Stanley, 8) Bank of New York Mellon and 9) State Street. Other US financial institutions eligible for the plan have until November 14 to agree to the terms.
- **October 15:** Greece announces a €28 billion package to support the banking sector and sustain economic growth.
- **October 17:** The European Union 27 leaders sign off on a joint U.S. $2.7 trillion bank bailout plan after a 2-day summit in Brussels.
- **October 19:** The South Korean government announces a U.S. $130 billion rescue package for its banks and companies to help withstand the credit crisisl.

  The Dutch government injects €10 billion into banking and insurance group ING.
- **October 20:** Pakistan discusses a U.S. $10-15 billion international support package with the International Monetary Fund. Iceland seeks U.S. $6 billion rescue package from the International Monetary Fund to help stabilize its economy. Sweden announces a U.S. $205 billion program to stabilize its financial system and boost liquidity.
- **October 21:** The US Federal Reserve announces that it will spend U.S. $540 billion to purchase short-term debt from money market mutual funds. The large amount of redemption requests during the credit crisis have caused the money market funds to scale back lending to banks contributing to the credit freeze on interbank lending markets. This government is hoping the injection will help unfreeze the credit markets making it easier for businesses and banks to obtain loans. The structure of the plan involves

the Fed setting up four special purpose vehicles that will purchase the assets.[18]

- **November 4:** Brazil's second largest non-state bank. Itau Holding Financeira SA, will purchase its smaller rival, Unibanco, creating Latin America's largest bank.
- **November 5:** Barack Obama wins the US presidential election.
- **November 12:** Treasury Secretary Paulson abandons plan to buy toxic assets under the U.S. $700 billion Troubled Asset Relief Program (TARP). Mr. Paulson said the remaining U.S. $410 billion in the fund would be better spent on recapitalizing financial companies.
- **November 15:** The group of 20 of the world's largest economies meets in Washington DC and releases a statement of the meeting. Although no detailed plans were agreed upon, the meeting focused on implementing policies consistent with five principles: strengthening transparency and accountability, improving regulation, promoting market integrity, reinforcing cooperation and reforming international institutions.
- **November 17:** The Treasury gives out U.S. $33.6 billion to 21 banks in the second round of disbursements from the U.S. $700 billion bailout fund. This payout brings the total to U.S. $158.56 billion so far.
- **November 24:** The U.S. government agrees to rescue Citigroup after an attack by investors causes the stock price to plummet 60 per cent over the last week under a detailed plan that including injecting another U.S. $20 billion of capital into Citigroup bringing the total infusion to U.S. $45 billion.
- **November 25:** The U.S. Federal Reserve pledges U.S. $800 billion more to help revive the financial system. U.S. $600 billion will be used to buy mortgage bonds issued or guaranteed by Fannie Mae, Freddie Mac, and the Federal Home Loan Banks.
- **November 28:** The Bank for International Settlements (BIS), the global organization behind the Basel Accord, issues a consultative paper providing supervisory guidance on the valuation of assets. The paper provides ten principles that should be used by banks to value assets at fair market value.
- **December 11:** The Bank of Korea cuts interest rates to 3 per cent, more than twice the expected reduction. Korea may be hurt significantly by the global financial crisis because of its high levels of foreign debt.
- **December 17:** In a surprise move, the Federal Reserve Lowers interest rates to a range of 0-0.25.

- **December 18:** Norges Bank cuts Norway's interest rate to 3 per cent.
- **December 19:** The Bank of Japan cuts Japan's interest rate to 0.1 per cent.
- **December 22:** China cuts interest rates to 5.31 per cent, the fifth cut in the last three months. The People's Bank of China also reduced the capital reserve requirement by 50 basis points in an effort to restore China's high growth rate.

2009:

- **January 8:** The Bank of England cuts interest rates to 1.5 per cent to help ease the flow of credit to companies. This brings the UK interest rate to a 315-year low.
- **January 10:** Unemployment is the United States jumps to 7.2 per cent, its highest in 16 years. Unemployment was at 4.4 per cent before the credit crisis hit.
- **January 14:** Standard & Poor's (S&P) cuts Greece's credit rating on debt. S&P cited the worsening of Greece's large public debt as the reason for the downgrade. Greece is the first major western European country to have its debt downgraded, but Portugal, Spain, and Ireland are being closely watched by the credit rating agencies.
- **January 23:** Reports show the global credit crisis contagion continues to deepen in Asia. China announces the slowest growth in seven years, the Bank of Japan reduced economic forecasts for the next two years, and South Korea reports the first decline in quarterly economic growth since the Asian financial crisis.
- **February 7:** Job losses in the United States reach 3.5 million in the last 12 months, including 500,000 in January. The jobs lost in January represent the highest losses in the US since 1974. The unemployment rate has risen to 7.6 per cent, almost double the 4.4 per cent before the credit crisis.
- **February 17:** US President Barack Obama signs a U.S. $787 billion economic stimulus package into law. The stimulus is designed to jump start the economy and create more jobs by through government spending and tax cuts.
- **February 18:** A study by the Boston Consulting Group shows that the global financial crisis has depleted the market value of the world's banks by U.S. $5.5 trillion. This amount is equivalent to 10 per cent of the world's gross domestic product.

- **February 25:** The US Treasury announces details of the Capital Assistance Program (CAP). The CAP plan includes running stress tests on banks to determine if the banks will require additional capital.
- **February 26:** The UK government announces a plan to insure U.S. $712 billion in toxic assets.
- **February 27:** The US Treasury announces it will take a 36 per cent stake in Citigroup. The UK government releases plans to inject £25.5 billion (U.S. $36.5 billion) into the Royal Bank of Scotland (RBS).

  U.S. President Barack Obama releases a 10-year budget outline for the US economy. The budget allows for U.S. $750 billion of new capital for financial stabilization efforts. The budget shows the US deficit quadrupling in 2009 to U.S. $1,750 billion.
- **March 9:** A study by the Asian Development Bank (ADP) shows that the value of global financial assets tumbled U.S. $50 trillion in 2008. The losses in Asia alone totaled U.S. $9.6 trillion, the highest of any emerging economy.
- **March 12:** The African Development Bank (AfDB) sets up a U.S. $1.5 billion emergency bailout fund to help alleviate the impact of the global financial crisis in Africa.
- **March 13:** G20 finance ministers meet in southern England to discuss strategies to fix the global economy. China promised to support the global economy with its available stimulus tools if necessary.
- **March 17:** In February, credit card defaults in the U.S. rise to the highest level in the last 20 years. Two of the largest issuers, Citigroup and American Express, reported default rates of around 9 per cent.
- **March 23:** The U.S. Treasury announces details of the Public-Private Investment Program. The program includes using U.S. $75 to U.S. $100 billion from the Troubled Asset Relief Program combined with private capital to generate U.S. $500 billion to buy toxic assets from troubled banks.
- **March 30:** The Bank of Spain rescues the first Spanish financial institution since the financial crisis began. The government will provide U.S. $11.9 billion in liquidity to Caja Castilla La Mancha (CCM) and replace its directors with central bank nominees.
- **April 2:** G20 leaders meet in London to combat the global financial crisis.
- **June 18:** President Obama reveals a dramatic overhaul of way the U.S. government oversees financial markets.

- **June 20:** The European Union approves a plan to create a European Systemic Risk Council for financial regulation.

Footnotes

1. On September 7, 2008, the director of the Federal Housing Finance Agency (FHFA), James B. Lockhart III, announced his decision to place two Government sponsored enterprises (GSEs), Fannie Mae and Freddie Mac, into conservatorship run by the FHFA. It was one financial event among many in the ongoing subprime mortgage crisis.

   The Federal National Mortgage Association (FNMA), commonly known as Fannie Mae, was founded in 1938 during the Great Depression as part of the New Deal. The Federal Home Loan Mortgage Corporation (FHLMC), known as Freddie Mac was created in 1970. Both of them were created to expand the secondary market for mortgages in the U.S. Fannie Mae and Freddie Mac buy mortgages on the secondary market, pool them, and sell them as a mortgage backed security to investors on the open market. This secondary mortgage market increases the supply of money available for mortgage lending and allows lenders to reinvest their assets into more lending for new home purchases.
2. Greece's credit rating was cut three levels from B to CCC by Standard & Poor's, which branded the nation with the world's lowest debt grade and said a restructuring looks "increasingly likely." S&P said: "Risks for the implementation of Greece's E.U./IMF borrowing program are rising, given Greece's increased financing needs and ongoing internal political disagreements surrounding the policy conditions required."
3. On September 15, 2008. Ten of the world's largest banks agree to pool U.S. $70 billion in a liquidity fund to mitigate the expected failure of Lehman Brothers. The ten banks involved are Banks of America, Barclays, Citigroup, Credit Suisse, Deutsche Bank, Goldman Sachs, JP Morgan Chase, Merrill Lynch, Morgan Stanley, and UBS. Each of the banks will be able to borrow up to one third of the fund by pledging a wide range of collateral that is not accepted for Fed loans. The Fed also relaxed regulations and said it would allow a broader range of collateral for Fed loans and it will also suspend the rule that prohibits deposit-taking banks from using deposits to help finance their investment banking subsidiaries until January 30, 2009.
4. Collateralized debt obligations (CDOs) are a type of structured asset-backed security (ABS) whose value and payments are derived from a portfolio of fixed-income underlying assets. To create a CDO, a special purpose entity (SPE) is designed to acquire a portfolio of underlying assets

as collateral. Common underlying assets held include mortgage-backed securities, commercial real estate bonds and corporate loans. The SPE issues bonds to investors in exchange for cash, which is used to purchase the portfolio of underlying assets. CDOs securities are split into different risk classes, or tranches, whereby “senior” tranches are considered the safest securities. Interest and principal payments are made in order of seniority, so that junior tranches offer higher coupon payments (and interest rates) or lower prices to compensate for additional default risk.

5. The very low U.S. interest rates in this period were hugely lucrative to the banks, allowing them to take on more debt, improve the terms of their business and expand its volume. They sponsored hedge funds and private equity buyouts, packaged their own mortgage-related financial instruments, arranged bond insurance, and furnished lines of credit to their own structured investment vehicles (SIVs) and “conduits”. These bets were usually leveraged by extra helpings of debt, with some institutions, the investment banks and hedge funds, borrowing to buy assets worth as much as thirty times their capital. This is the core of the shadow banking system as we explained in that section.
6. In 2004, as regulators warned that subprime lenders were saddling borrowers with mortgages they could not afford, the U.S. Department of Housing and Urban Development helped fuel more of that risky lending. Eager to put more low-income and minority families into their own homes, the agency required that two government-chartered mortgage finance firms purchase far more “affordable” loans made to these borrowers. HUD stuck with an outdated policy that allowed Freddie Mac and Fannie Mae to count billions of dollars they invested in subprime loans as a public good that would foster affordable housing. The agency neglected to examine whether borrowers could make the payments on the loans that Freddie and Fannie classified as affordable. From 2004 to 2006, the two purchased U.S. $434 billion in securities backed by subprime loans, creating a market for more such lending. Subprime loans are targeted toward borrowers with poor credit, and they generally carry higher interest rates than conventional loans. Today, 3 million to 4 million families are expected to lose their homes to foreclosure because they cannot afford their high-interest subprime loans. Lower-income and minority home buyers who were supposed to benefit from HUD’s actions are falling into default at a rate at least three times that of other borrowers. Housing experts and some congressional

leaders now view those decisions as mistakes that contributed to an escalation of subprime lending that is roiling the U.S. economy.

7. The Community Reinvestment Act (or CRA, Pub.L. 95-128, title VIII of the Housing and Community Development Act of 1977) is a United States federal law designed to encourage commercial banks and savings associations to meet the needs of borrowers in all segments of their communities, including low- and moderate-income neighborhoods. Congress passed the Act in 1977 to reduce discriminatory credit practices against low-income neighborhoods, a practice known as redlining. The Act requires the appropriate federal financial supervisory agencies to encourage regulated financial institutions to meet the credit needs of the local communities in which they are chartered, consistent with safe and sound operation (Section 802). To enforce the statute, federal regulatory agencies examine banking institutions for CRA compliance, and take this information into consideration when approving applications for new bank branches or for mergers or acquisitions (Section 804).
8. A credit default swap (CDS) is a swap contract and agreement in which the protection buyer of the CDS makes a series of payments (often referred to as the CDS “fee” or “spread”) to the protection seller and, in exchange, receives a payoff if a credit instrument (typically a bond or loan) experiences a credit event. It is a form of reverse trading. In its simplest form, a credit default swap is a bilateral contract between the buyer and seller of protection. The CDS will refer to a "reference entity" or "reference obligor", usually a corporation or government. The reference entity is not a party to the contract. The protection buyer makes quarterly premium payments—the "spread"—to the protection seller. If the reference entity defaults, the protection seller pays the buyer the par value of the bond in exchange for physical delivery of the bond, although settlement may also be by cash or auction. A default is referred to as a "credit event" and includes such events as failure to pay, restructuring and bankruptcy. Most CDSs are in the $10–$20 million range with maturities between one and 10 years. A holder of a bond may “buy protection” to hedge its risk of default. In this way, a CDS is similar to credit insurance, although CDS are not similar to or subject to regulations governing casualty or life insurance. Also, investors can buy and sell protection without owning any debt of the reference entity. These “naked credit default swaps” allow traders to speculate on debt issues and the creditworthiness of reference entities.

Credit default swaps can be used to create synthetic long and short positions in the reference entity. Naked CDS constitute most of the market in CDS. In addition, credit default swaps can also be used in capital structure arbitrage.

9. The High-Grade Structured Credit Strategies Enhanced Leverage Fund, as of Apr. 30, 2007, was down a whopping 23 per cent for the year. The situation is so bleak that Bear Stearns' asset management group is suspending redemptions at the onetime U.S. $642 million fund – meaning investors have no choice but to sit on their losses.
10. A stated income loan is a mortgage where the lender does not verify the borrower's income by looking at their pay stubs, W-2 forms, income tax returns, or other records. Instead, borrowers are simply asked to state their income, and taken at their word. These loans are sometimes called "liar loans". Stated income loans are nominally intended for self-employed borrowers, or other borrowers who might have difficulty documenting their income. These loans have been extended to customers with a wide range of credit histories, including subprime borrowers. The lack of verification makes these loans particularly simple targets for fraud. Stated income loans were originated by Ameriquest.
11. New York (MarketWatch) – Morgan Stanley said it laid off about 300 bankers in its credit trading, structured products and leveraged lending areas as a result of the freeze in activity in global credit markets. The layoffs range from managing directors to associates, including several senior people who traded and sold mortgage-backed securities and worked on arranging loans for private-equity firms' leveraged buyouts. The bulk of the layoffs are occurring in the U.S. though about 70 to 80 people are losing jobs in Europe and a handful in Asia.
12. This limit refers to the conforming mortgage limit.
13. The Federal Housing Administration (FHA) is a United States government agency created as part of the National Housing Act of 1934. Insured loans made by banks and other private lenders for home building and home buying. The goals of this organisation are: to improve housing standards and conditions; to provide an adequate home financing system through insurance of mortgage loans; and to stabilise the mortgage market.
14. The Reserve Primary Fund is a large money market mutual fund which is managed by Reserve Management Corporation (RMC). On September 16, 2008, it lowered its share price below U.S. $1 ("breaking the buck")

because RMC decided to write U.S. $785 million held in Lehman Brothers debt down to zero. This resulted in demands from investors to return their funds as the financial crisis mounted. The net asset value of the fund's share is 97 cents and normally, the NAV of money market funds is kept at U.S. $1. This is the first time since 1994 that this has happened to a money market fund.

15. The withdrawals from money funds were stunning. They generated by far the highest redemptions on record, losing U.S. $144.5 billion through earlier this past week, according to AMG Data Services. The industry had only U.S. $7.1 billion in redemptions the week before. The redemptions subsequently created huge problems for the U.S. $1.7 trillion commercial-paper market. Money funds were not buying the paper anymore and were dumping it to cash out fleeing investors. This threatened to tip the economy into recession by cutting off a vital funding source for U.S. business. The funds' push into Treasurys helped pull their short-term yields down to zero, which backfired on the money funds. On Friday, fund tracker Lipper said that more than 40 per cent of the 1,263 U.S. taxable money-market mutual funds it tracks posted zero returns amid their negligible returns from their concentration in government paper. As a result of money funds' buyers strike, commercial paper became increasingly expensive; soaring to 8 per cent yields from a little more than 2 per cent the week before as investors demanded to get paid more for taking on increasing risk. Companies like International Business Machines Corp. had to pay as much as 6 per cent for such borrowing this week.
16. U.S. Treasury Secretary Henry Paulson proposed a plan under which the U.S. Treasury would buy up to U.S. $700 billion of illiquid mortgage backed securities (MBS) with the intent to increase the liquidity of the secondary mortgage markets and reduce potential losses encountered by financial institutions owning the securities. This plan can be described as a risky investment, as opposed to an expense. The MBS within the scope of the purchase program have rights to the cash flows from the underlying mortgages. As such, the initial outflow of government funds to purchase the MBS would be offset by ongoing cash inflows represented by the monthly mortgage payments. Further, the government eventually may be able to sell the assets, though whether at a gain or loss will remain to be seen. While incremental borrowing to obtain the funds necessary to purchase the MBS may add to the United Stated public debt, the net effect will be

considerably less as the incremental debt will be offset to a large extent by the MBS assets.

The original proposal was submitted to the United States House of Representatives and then expanded and put forth as an amendment to H.R. 3997. The amendment was rejected via a vote of the House of Representatives on September 29, 2008, voting 205-228. On October 1, 2008, the Senate debated and voted on an amendment to H.R. 1424, which substituted a newly revised version of the Emergency Economic Stabilisation Act of 2008 for the language of H.R. 1424. The Senate accepted the amendment and passed the entire amended bill, voting 74-25. The amended version of H.R. 1424 was sent to the House for consideration, and on October 3, the House voted 263-171 to enact the bill into law. President George W. Bush signed the bill into law within hours of its congressional enactment, creating the U.S. $700 billion Troubled Asset Relief Program (TARP) to purchase failing bank assets.

17. The Republican Party is one of the two major contemporary political parties in the United States, along with the Democratic Party. Founded by anti-slavery expansion activists in 1854, it is often called the Grand Old Party (GOP).
18. The Federal Reserve Board announced the creation of the Money Market Investor Funding Facility (MMIFF), which will support a private-sector initiative designed to provide liquidity to U.S. money market investors. Under the MMIFF, authorized by the Board under section 13(3) of the Federal Reserve Act, the Federal Reserve Bank of New York (FRBNY) will provide senior secured funding to a series of special purpose vehicles to facilitate an industry-supported private-sector initiative to finance the purchase of eligible assets from eligible investors. Eligible assets will include U.S. dollar-denominated certificates of deposit and commercial paper issued by highly rated financial institutions and having remaining maturities of 90 days or less. Eligible investors will include U.S. money market mutual funds and over time may include other U.S. money market investors. The short-term debt markets have been under considerable strain in recent weeks as money market mutual funds and other investors have had difficulty selling assets to satisfy redemption requests and meet portfolio rebalancing needs. By facilitating the sales of money market instruments in the secondary market, the MMIFF should improve the liquidity position of money market investors, thus increasing their ability to

meet any further redemption requests and their willingness to invest in money market instruments. Improved money market conditions will enhance the ability of banks and other financial intermediaries to accommodate the credit needs of businesses and households.

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