

# THE FINANCIAL CRISIS OF 2008 IN THE USA: AN OVERVIEW

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## Abstract

### The Financial Crisis of 2008 in the USA: An Overview

*This paper examines the origins of sub-prime mortgage market crisis and developments that transformed it into the most severe financial crisis of the United States (US) in history since the Great Depression of 1930s. The crisis began with the problems of the mortgage market in the summer of 2007. In September 2008, after the collapse of the one of the big investment banks of the US, Lehman Brothers, it gained another dimension and affected the financial markets of the world and the global economy. The main reason of the crisis was the existence of a real estate bubble in the US. This, in turn, was caused by the over expansionary monetary policies of the Federal Reserve Board since 2001 and global imbalances. With the explosion the real estate bubble, disruptive effects of the crisis on both the real economy and the financial system became more apparent. Among the others, the general loss of confidence on the future course of the economy, weak regulatory structure, over indebtedness, and increased risk appetite of investors were the factors that contributed to this deterioration. Authorities resort to various policy measures in order to reduce the adverse effects of the crisis both at the macro and micro levels, and put them into practice. Yet till now, there is no wide agreement on the explanation of the main causes of the crisis, and what should be done in order to prevent a similar crisis in the future.*

**Keywords:** *financial crisis of 2008, sub-prime mortgage market, the US monetary policy, global imbalances, real estate bubble, credit expansion.*

**JEL Code:** E44, E52, E61, G18, G20.

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## Özet

### ABD'deki 2008 Finansal Krizi: Genel Bir İnceleme

*Bu makale, eşik-altı ipotekli konut piyasası krizinin kökenlerini ve bunu, 1930'ların Büyük Buhranı'ndan beri Amerika Birleşik Devletleri (ABD) tarihindeki en şiddetli finansal krize dönüştüren gelişmeleri incelemektedir. Kriz, ipotekli konut piyasasının sorunlarıyla 2007 yazında başlamıştır. Eylül 2008'de, ABD'nin büyük yatırım bankalarından birisi olan Lehman Brothers'ın batmasından sonra farklı bir boyut kazanmış ve dünya finans piyasalarıyla küresel ekonomiyi etkilemiştir. Krizin ana sebebi, ABD emlak piyasası fiyatlarında ortaya çıkan balondur. Buna da ABD Merkez Bankası'nın 2001 yılından beri izlediği aşırı genişlemeci para politikası ile küresel dengesizlikler neden olmuştur. Emlak piyasasında oluşan balonun patlamasıyla, krizin hem reel ekonomi hem de finansal sistem üzerindeki yıkıcı etkileri daha açık hale gelmiştir. Diğerleri arasında, ekonominin gelecekteki gidişatına dair genel bir güven kaybı, zayıf yasal yapı, aşırı borç yükü ve yatırımcıların artan risk iştahı bu bozulmaya katkıda bulunan faktörler olmuştur. Otoriteler, krizin olumsuz etkilerini azaltmak için hem makro hem de mikro düzeyde çeşitli politika tedbirlerine başvurmuşlar ve bunları uygulamaya koymuşlardır. Ne var ki, bugüne kadar krizin ana nedenleri üzerinde ve gelecekte benzer bir krizi önlemek için ne yapılması gerektiği konusunda genel kabul görmüş bir açıklama yoktur.*

***Anahtar kelimeler:** 2008 finansal krizi, eşik-altı ipotekli konut piyasası, ABD para politikası, küresel dengesizlikler, emlak balonu, kredi genişlemesi.*

**JEL Sınıflaması:** E44, E52, E61, G18, G20.

## 1. Introduction

Financial crises are nothing new. They are typically preceded by credit booms and asset price bubbles. Also, many of them are the result of bubbles in real estate markets. From this point of view, the current financial turmoil, and the period preceding it, shares many of the characteristics of the previous bubbles in history. In recent years, there have been crises in emerging or middle-income countries of the world as well. The severe crises in Japan and in Scandinavia in 1990s are other examples. However, they had not so much impact on the world economy. Unlike past crises, the current crisis has affected almost every country and region of the world. It originated in the sub-prime mortgage market in the United States (US) and then spread

over other financial markets. With billions of dollars of write offs and record losses, banks have never before destroyed so much value in a short period of time. The current crisis had also a significant impact on the real global economy. It plunged economies into recession, creating unemployment levels unforeseen for a long time. The general consensus was that the crisis was the worst since the Great Depression.

In the literature, there are two perspectives on the causes of the financial crisis. One is the historical perspective and the other is the quantitative perspective. The historical perspective emphasizes that bubbles and busts are recurring events and that periods leading to financial crises are often very similar while the quantitative perspective focuses on the period for which reliable data are available and that tries to determine the quantitative indicators of financial crisis. The motivation of this study is to provide an overview of the financial crisis of 2008 in the US by using the insights from both strands of the literature.

This paper aims at analyzing the main causes of the crisis, its effects on the real economy and on the financial system, and policy responses to the crisis. The paper is organized as follows. Section 2 examines the causes of the crisis with a focus on the existence of a real estate bubble in the US. Section 3 discusses the effects of the crisis on the real economy and those on the financial system, and explains the reasons for deterioration in global economic activity and the current financial turmoil. Section 4 evaluates the policy responses of authorities in the aftermath of the crisis and recovery proposals on the medium-term agenda, and highlights the need for a new financial infrastructure and new financial stability frameworks. Finally, section 5 concludes the paper.

## **2. Causes of the Crisis**

The US financial crisis of 2008 has generated a huge literature analyzing its origins and the correct policy response. However, there is still no satisfactory answer to the question of ‘what caused the crisis?’ This issue has been extensively debated in recent years and there is no doubt that it will continue to be debated in the future.

## 2.1. Problems in the US Mortgage Industry

The crisis began with the emergence of problems in the US mortgage industry in the first half of 2007. One feature of this period was that the sub-prime lending became very important.<sup>1</sup> Sub-prime loans increased from about US\$52 billion in 2001 to more than US\$400 billion in 2005 and 2006.<sup>2</sup> By 2006, these loans were about one-fifth of new housing lending and an estimated 15% of the stock of outstanding housing loans in the US.<sup>3</sup> But what was more important than the increase in sub-prime lending was that the way the mortgage industry worked had changed significantly over the years. Given the weaknesses in risk control and management techniques in financial institutions, the growth of the ‘originate to distribute model’ in mortgage lending, securitization of sub-prime and other loans, and unhelpful role played by the ratings agencies encouraged excessive risk-taking and caused problems in the US mortgage industry.

Traditionally, banks raise funds, screen borrowers, and then extend loans to those approved. If the borrowers defaulted, the banks would bear the losses. This system provided good incentives for banks to examine the credit risks of their customers. However, that process changed and incentives were altered over time. Instead of banks originating mortgages and holding on to them, brokers and also some banks started originating them and selling them to be securitized. This process is called the ‘originate to distribute model’ (Allen and Carletti, 2010). Under the originate to distribute model of intermediation, loans were quickly resold to other investors and monitoring of underlying credit quality was overlooked in general because of the common illusion that risks had been transferred elsewhere or hedged (Carmassi et al., 2009). The originators, the brokers and the banks, were paid on the basis of the number of mortgages that they approved so their incentives were to approve as many mortgages as possible. Because they were selling them off, it was not their concern in the long run whether the borrowers defaulted.

The securitization of sub-prime and other loans and their subsequent sale to both domestic and foreign investors were undertaken by entities such as investment banks. This occurred partly through conventional mortgage-backed securities (MBS) but also, increasingly, through more complex products such as collateralized debt obligations (CDOs) that promised high

returns with low risk thanks to the advances in financial model building. The securitizing investment bank pool a whole set of mortgages together and then tranche them into different risk categories, with the most senior tranches given the most protection against potential losses. It means that there must be a large amount of losses before the most senior tranches would bear any losses. So, they were regarded as fairly risk-free securities and had higher credit ratings than more junior tranches (Allen and Carletti, 2010). Even though the average quality of the underlying loans was poor, these features of senior tranches made them attractive to investors along with their relatively high returns. Market participants held an overly optimistic view of the evaluation of the riskiness of these securities. However, they failed to recognize that the layering structure (the seniority chain) of these ‘securitized’ pools of loans could result in large losses, even to the most senior tranches, in case of a general downturn in the US housing market (Edey, 2009).

The new originate to distribute model of intermediation also distorted incentives and risk management arrangements in financial organizations. Initially with this new system, the most junior tranches were kept by the entity doing securitization. If there was a problem, it would be hit first. This provided good incentives to those doing the securitization. However, this attitude changed over time and all tranches were sold off, including the junior ones. This took away the incentives for financial institutions doing the securitization to control that the originations and the subsequent sale were done properly (Allen and Carletti, 2010).

Another related issue was about the role played by the ratings agencies. Because buyers of tranches use information from ratings agencies in making their decisions, an important question emerged whether they were checking the securitization process carefully. They were not because they began to receive much of their income from undertaking ratings of securitized products. They lost their objectivity and gave unfair ratings. That’s why the ratings agencies failed to spot excessive risk-taking of financial institutions during the crisis (Carmassi et al., 2009).

In sum, the problems of the US mortgage industry were at the immediate background to the crisis. The whole procedure for checking the quality of borrowers, and the mortgages underlying the securitizations broke down.

Initially, this view was also adopted by the Federal Reserve Board (FED) and Treasury. However, as the crisis continued and affected the global real economy, it became very difficult to believe that sub-prime mortgages were responsible for what was going on. Therefore, the mortgage industry view of the crisis did not provide a sufficient answer to the deeper question of what were the underlying causes of the crisis.

## **2.2. The Real Estate Bubble**

The basic problem that caused the crisis was that the US experienced a real estate bubble. According to Case-Shiller index, the increase in house prices between the years 1996 and 2006 was about 86% in real terms. House prices started to decline at the beginning of 2006 and since then continued to move down rapidly. The ratio of house prices to rents like the price earnings ratio for stocks, which relates the prices of houses to their expected future rents, followed a similar pattern as well, indicating an asset price bubble. Therefore, a real estate bubble emerged in the US before the crisis and has exploded, leading to big problems in the securitized mortgage market and a sharp contraction in the real economy.<sup>4</sup>

There were two main factors that caused the bubble. One was the low interest rate policies adopted by the FED after the collapse of the technology stock bubble and the other was global imbalances.

### **2.2.1. The Role of US Monetary Policy**

“Monetary policy in the US was accommodating throughout the 1990s and became aggressively expansionary in the 2000s...” (Carmassi et al., 2009: 983). In January 2001 a technology-driven productivity boom came to an end, with the collapse of the dotcom stock market, followed shortly after September 11 events. FED’s response was to start lowering the Federal funds rate from 6.5% in 2001 and bring it down to 1% in 2003 and keep it there for over a year. This policy was motivated by the FED’s intention to avoid a recession and in particular to keep the economy away from the risk of debt-deflation spiral that the Japanese economy experienced in the 1990s and early 2000s (Lewis, 2009).

This over expansionary monetary policy of 2002-2004 provided a significant incentive for people to borrow at 1% and buy houses whose prices were increasing at a much higher rate. There were also other public policies that encouraged people to purchase houses (e.g. tax advantages, favorable conditions for poor people to buy houses and so on). These factors altogether created a large demand for houses and led to increases in house prices. Even when the FED began raising interest rates in June 2004, it was still worth borrowing because house prices continued to rise at a rate above 8% until 2006.<sup>5</sup>

### **2.2.2. Global Imbalances**

The second factor that caused to dramatic increase in house prices was global imbalances, which led to a growth in lending. The role of global imbalances in creating asset price bubbles is a complex issue. There is no single explanation of it. Bernanke's (2005) thesis, which emphasizes the appetite of Asian central banks for US debt securities, will be discussed below.

One basic feature of the real estate bubble was that there was abundant liquidity in world capital markets, fed by large payment imbalances between the main countries and other regions in the world economy. That is, a large and persistent current account deficit in the US (from a situation of near balance in 1991, which increased to US\$811 billion, or 6.1% of GDP in 2006) financed by ample flows of capital from emerging and oil-exporting countries. These global imbalances (i.e., the US current account deficit, and the corresponding surpluses elsewhere in the world economy) dominated global financial flows and led to an explosion in financial activity. Given the lack of depth in global financial system, they could not sustain for a long time. According to Bernanke, these current account deficits were the counterpart of a 'global savings glut', caused by the increase in the rate of savings of Asian countries that wanted to establish large reserve cushions against a repetition of the financial crises of the late 1990s.

Trends in global savings and investment between the years 1984-2005 show that the US is the only grouping (although not the only country) for which savings is less than investment.<sup>6</sup> If one region (the US) has national

savings that falls short of its capital investment, then this shortage of savings relative to investment must necessarily be satisfied by a surplus of savings relative to investment elsewhere. The surplus of savings outside the US, which Bernanke calls the ‘global savings glut’, comes in part from industrial countries such as Japan and Germany. These countries are characterized by aging populations and declining labor forces, along with a lack of domestic investment opportunities. However, the largest part of the surplus of savings comes from emerging markets and oil producing economies. This can be explained by two major factors. One is a determined policy of especially Asian countries that experienced financial crises in 1990s to avoid a repeat performance by reducing their vulnerability to foreign capital and by building up international mainly (dollar) reserves. For this purpose, they encouraged domestic savings by issuing debt to their citizens, and then used the funds to accumulate US Treasury securities, MBS, and many other debt securities as strategic reserves. The other factor is the sharp rise in oil prices that has boosted the current account surpluses of oil exporting countries.

The ‘global savings glut’ forced US interest rates down, particularly on long-term maturities. Therefore, US households go into debt and continue to spend. The global financial system intermediated the funds between Asian central banks and US households without taking the risks into consideration. The large supply of funds relaxed lending standards to ensure that there was enough demand for them from house buyers and other borrowers. This brings about another basic feature of the real estate bubble, a credit boom leading to an unsustainable leverage.

### **2.2.3. Rapid Credit Expansion**

The growth in credit is important for asset price bubbles. Almost all major crises were preceded by a combination of an increase in leverage, following excessive credit expansion and an unusual increase in asset prices. In an environment of constantly increasing house prices, banks encourage households to borrow up to the full value of their property, and to borrow more as soon as the value went up, without taking into account their ability to service debt (Carmassi et al., 2009). Many banks satisfied homeowners’ desire to borrow for consumption purposes against the rising value of their

houses, and assisted others to become first time homeowners and lent to those who have almost no chance of repayment. As a result, borrowers with little or no capital and a poor credit history could obtain a real estate loan (Lewis, 2009).

The quantitative indicators of financial crises are also consistent with the second basic feature of the real estate bubble.<sup>7</sup> For example, an aggregate measure of leverage is given by the ratio of total credit to GDP. Rapid increases in this ratio can be considered as a warning signal for financial crises. The increase in economy-wide leverage (measured by the debt-to-GDP ratio) for the US between the years 1999 and 2007 was around 80% of GDP. This ratio was only 3% for the corporate sector, but households' leverage increased to 40% of GDP. Financial sector leverage also increased to about 40% of GDP. This result can be verified by micro data on the degree of leverage among largest banks. Among the big five investment banks, at the end of 2007 Goldman Sachs had liabilities close to 30 times of its capital, while the others showed ratios between 36 and 39. The average for all of them was 26.5. Large US commercial banks were subject to strict capital requirements, but many of them were hidden their risks and leverage by engaging in off-balance sheet activities.

Therefore, loose monetary policy of the FED and the global imbalances, which increased the amount of funds available to invest in US debt securities and encouraged excessive leverage through credit expansion, were two main factors responsible for the real estate bubble.

### **3. The Road to Crisis**

The bubble burst probably due to a rise in policy rates in June 2004 as a reaction to the unavoidable inflationary pressure (Bordo, 2008). By mid-2006, house prices started to fall in the US. The fall in house prices led to a fall in the prices of securitized sub-prime mortgages, affecting financial markets worldwide. The FED and other central banks implemented various measures to improve the operation of the money markets. During the fall of 2007, the prices of sub-prime securitizations continued to decrease and many financial institutions came under strain. In March 2008, the FED bailed out

Bear Stearns through an arranged merger with J.P. Morgan. Although the financial system and in particular banks came under heavy pressure during this period, the real economy was not much affected. All that changed in September 2008 after the collapse of the Lehman Brothers. The level of economic activity in the US and major economies took a sharp turn. Unemployment dramatically rose. The crisis was considered to be one of the most important economic shocks in the post-war period.

### **3.1. Effects on the Real Economy**

Following the demise of Lehman and the associated turmoil in financial markets, there was an extraordinary decline in global industrial production and significant contractions in GDP in most of the major economies. While the GDP growth rate for the world economy was 5.2% in 2006 and 5.3% in 2007, it declined to 2.8% in 2008 and -0.6% in 2009. The GDP growth rates for the US, European Union (EU), and Japanese economies were -2.6%, -4.1%, and -5.2% in 2009 respectively. The average unemployment rate for the developed countries was around 6% in 2008, and this ratio was 2 percentage points higher for the Euro Area. Since the start of the crisis, unemployment has increased from 4.7% to 10.2% in the US. The downturn in the G7 countries intensified during the last quarter of 2008 -especially in Japan- and spread to other regions of the world, including Asia, Latin America, and Eastern Europe. These numbers indicated the weakest year for the global economy in the post-war period and a sudden deterioration in global economic activity.<sup>8</sup> As Reinhart and Rogoff (2009) pointed out, the global nature of this crisis made it much more difficult for many countries to escape it.

The reason for this sudden deterioration in global economic conditions was a general loss of confidence, which was verified by survey-based indicators in the major economies.<sup>9</sup> It occurred because people made wrong decisions for a long time, assuming that asset prices would remain high and would continue to rise (Allen and Carletti, 2010). In the US, household savings reduced to a position of dissavings and household borrowing increased

after 2000. Approximately one-half of the all US families did not save any portion of their incomes between 2001 and 2004. Rising asset prices and easy access to credit of US households pumped up the US economy by accelerating consumption spending. Therefore, consumption increased to more than 70% of GDP and magnified an important imbalance of the economy by widening the current account deficit (Lewis, 2009). As was mentioned above, the leverage ratios of households, firms, and institutions went up. When asset prices began to fall, people understood that they were overleveraged and had saved too little. They started saving to pay their debts, to build up their assets, and to restore their wealth.

Because there was a bubble in asset prices for some time, the real value of assets became very uncertain. Highly volatile prices of equities and commodities as well as exchange rates made decision making for households and firms very difficult and created general uncertainty about the future price levels. In such an environment, it was difficult for anybody to make correct economic decisions and this was one of the main factors that discouraged the global economic activity.

In response to the general loss in confidence, along with the decline in housing and equity wealth and rising unemployment, households around the world re-evaluated their spending plans and cut back their discretionary spending particularly on manufactured goods. Private consumption fell sharply in the industrialized and emerging market economies in late 2008. Sales of consumer durables like cars in many countries dropped their early 2008 levels by around 25%. Similarly, business investment contracted in a number of countries in the late 2008 and early 2009 (Edey, 2009).

Because sales of consumer durables like cars and investment goods like machine tools declined in many countries and because they represented a large share of exports and imports, the world trade collapsed (Allen and Carletti, 2010). This was the so-called trade channel through which global economic conditions was affected adversely as businesses cut their production in response to reduced orders. Falls in exports and production were particularly evident for certain manufactured goods such as cars, steel, and electronics, and industrial production declined in large amounts in countries where these goods had a big share in total production. Moreover, firms around the world tried to economize on their holdings of inventories

in response to a weak expected demand for their goods and reduced availability of working capital.

Finally, part of the slowdown in global economic activity can be attributed to the shrinking of some sectors that had become overextended or overleveraged prior to the crisis. These were the housing and financial sectors as well as the highly indebted household sector of the major countries.

### **3.2. Effects on the Financial System**

The crisis began in the summer of 2007 with the fall in the values of sub-prime mortgages. Since then, the financial system faced important difficulties. Before the collapse of the Lehman, interbank markets were under heavy pressure. The conditions in collateralized markets were not so good either. Credit supply squeezed and it became more difficult to borrow with low-quality collateral. Lehman's demise in September 2008 affected the financial system in two ways (Allen and Carletti, 2010; Edey, 2009; Lewis, 2009). First, it caused a further tightening of credit standards by lenders in major economies. This demonstrated itself, among other things, in disruptions to trade credit and insurance, and in a tightening of lending to both consumer and business spending. As a consequence of these developments, the pace of credit growth fell sharply in a number of countries in late 2008 or early 2009, although part of this decline can be attributed to the decrease in credit demand. Second, it forced markets to re-assess risk. Lehman's bankruptcy induced substantial losses to several counterparties and as of early 2009, four of the five independent investment banks in the Wall Street failed because of their risky trading and excessive leverage. But its most important consequence was the signal it sent to the international markets that credit risk in the banking sector and financial system was a serious concern. Reassessing risks previously overlooked, investors withdrew from the markets and liquidity dried up. Accordingly, there was an additional increase in the price of risk.<sup>10</sup>

One of the underlying causes of this financial turmoil was the short-term financing structure of financial institutions in the US. Mortgages were held by institutions that were badly injured by asset price falls. Many of them

were held in investment banks or structured investment vehicles (SIVs) that were financed mainly by short-term liabilities. As soon as prices fell, there was a big problem because lenders did not know whether they were going to be paid back. This led to a flight to quality with many people wanting to purchase high-grade government securities (Allen and Carletti, 2010).

The problems started in securitized sub-prime mortgages but then spread to other parts of the financial system. Since 2003, financial intermediation started to grow much more rapidly. Interconnected banking system via the web of finance made it impossible to evaluate risks independently. When asset prices began to fall, these interconnections worked in opposite direction, bringing the failure of financial firms together and spreading panic among investors worldwide. The systemic implications of the reckless lending behavior, leverage, and securitization became apparent. The US regulatory system compounded these problems as well (Carmassi et al., 2009). This crisis provided an opportunity to policymakers to understand the dangers of globalization and integrated markets in the face of weak regulation (Pattanaik, 2009).

### **3.3. Weak Regulatory Performance**

The financial sector is among the most heavily regulated sectors of the economy in all countries. This is also true for the US where a number of authorities are responsible for regulating the financial sector. However, the current crisis came as a surprise to regulators and they failed to predict it. There are two reasons for this failure of the US regulatory system (Allen and Carletti, 2010). The first reason is that the banking regulation is very different from other types of regulation. With the banking regulation, the problem that is being solved is not clear. Also, there is no wide agreement that there is indeed a problem. The second reason is that the current structure of banking regulation is more a series of answers to particular problems in the past (e.g. the Great Depression) rather than the execution of a clear regulatory design. Whenever there was a problem, regulators implemented a regulation.

Lewis (2009) identified three weaknesses of the US regulatory system with respect to the current financial crisis. First, while the reckless behavior of lending institutions cannot be tolerated, features of the US mortgage market exacerbated developments. Homeowners generally receive favorable treatment and protection in front of the lenders in order to encourage homeownership particularly among the lower income classes and minority households.

Second, prior to the crisis, Fannie Mae and Freddie Mac used an implicit government guarantee to profitably expand their highly leveraged mortgage portfolios and sold off the rest, guaranteeing the MBS against default, while holding little capital. When the financial position of these government sponsored entities (GSE) deteriorated in 2008, they were forced into conservatism.

Third, banks such as Citigroup, UBS, and Goldman Sachs ran into difficulties with the specific-purpose highly complex investment vehicles (conduits, SIVs) established off-balance sheet. These subsidiaries or funds invest in assets with a high return and long duration and finance themselves by issuing asset-backed commercial paper. They often devised to avoid regulation (Bordo, 2008). For instance, a SIV is usually highly leveraged, 15-20 times the equity capital. The main idea behind the development of this sub-system was regulatory arbitrage. That's why banks were not loudly advertising such activities. It seems that all of this off-balance sheet activity escaped regulators' attention.

### **3.4. From Local Problems to a Global Financial Crisis**

The sub-prime segment only accounts for a small part of the US mortgage market, which in turn, amounts to less than 10%, in value terms, of total bonds and shares traded worldwide. However, a series of local US mortgage market problems gave rise to extensive disruption. Hildebrand (2008) gave four reasons why problems in the US sub-prime mortgage segment led to such dramatic turmoil.

First were the limitations of risk management practices and techniques. It has become clear that – with few exceptions – the world's largest banks

have failed to give sufficient attention to the risks of extreme events. Many market participants ran into liquidity problems because they simply had not anticipated such extraordinary market developments.

Second was the lack of transparency. For outsiders, the business conducted by international banks represents, in many respects, a black box. In general, banks have difficulties in providing understandable assessments of their risks. Therefore, in the crisis, market participants had great difficulty in assessing the creditworthiness of their counterparties quickly and accurately.

Third was the high leverage of international banks. As a rule, these banks hold relatively low levels of capital as compared to their total assets. That's why they are more vulnerable to risk. Meanwhile, trading has become increasingly important. The capital base appears very thin when set in relation to these investments, some of which – such as the sub-prime exposures – are extremely risky. When the crisis hit, they were forced to engage in deleveraging through the fire sale of assets into a falling market which in turn lowered the value of their assets and those of other financial institutions (Bordo, 2008). Consequently, in the current crisis, it took no more than losses in just one small part of business activities for various international banks to lose a significant part of their capital. The high leverage proved to be a dangerous tool when mixed with insufficient transparency and large exposures.

Fourth were the incentive schemes in the banking sector. Compensation incentives are asymmetric because on the upside, bonuses are proportional to profits and thus virtually open ended. On the downside, however, they are limited by the zero bound. In other words, while employees participate in profits, losses have to be borne by the bank, the shareholders or, in the extreme case, by taxpayers.

#### **4. Policy Responses**

In response to the crisis, governments implemented a variety of monetary, fiscal, and other policy measures. Some of these measures aimed immediately at repairing the damaged credit markets and restoring growth in demand and in economic activity while others aimed at reforming the

global financial infrastructure on the medium-term agenda by preventing similar crises in the future (Edey, 2009). As for the first set of policy measures, authorities provided direct assistance to their financial sectors. When financial problems emerged, central banks injected liquidity into the system and extended credit lines to all sorts of institutions. Other measures under this category included the rescue packages totaled about US\$4.0 trillion, which were aimed primarily at injecting fresh capital into weak institutions, guaranteeing liabilities of banks, and purchasing bad assets from the affected banks' balance sheets (Pattanaik, 2009). Public funds and guarantees were used in unprecedented bailouts. Some governments announced full deposit insurance to avoid bank runs. Significant steps were also undertaken by international organizations like International Monetary Fund (IMF) to provide official funds to emerging and developing countries.

In addition, low-interest rate policies of the central banks in major and emerging market economies continued as the crisis spread out. In the US, the interest rate cycle repeated since 2004 and policy rates were reduced to effectively zero at the end of 2008 (Lewis, 2009). However, the ramifications of this policy action were not clear. The pass-through effects of these reductions in policy rates to other interest rates were larger in some countries than in others.<sup>11</sup>

The recovery began in the mid-2009.<sup>12</sup> Early signs of these measures were promising. They improved the operation of financial markets. The extreme volatility after the collapse of the Lehman began to be settled in early 2009, and the availability of government guarantees enabled banks to raise long-term funds through bond issues. But it took sometime for these measures to be fully effective. Meanwhile, credit spreads remained high and lending has still been damaged by the cumulative erosion in asset values and its accompanying pressure on balance sheets.

Fiscal policy also provided a stimulus.<sup>13</sup> Many countries (e.g. United States, United Kingdom, Germany, and China) announced major packages to support demand in 2009 and 2010, which included direct financial support to households, tax reductions for firms, and direct spending by governments on infrastructure projects.

As for the second set of measures, at the macro level, proposals for a new financial infrastructure gain importance. There are four sets of proposals for a new financial infrastructure in the aftermath of the global financial crisis, namely a Keynesian pathway, a neoclassical route, a technocratic group of proposals, and an international coordination mechanism in a multi-polar world (Pixley, 2009).

The Keynesian route wants greater role for state over the financial industry and economic life in general. The huge rescue packages for the financial sector and proposed infrastructure investments are openly Keynesian. Different economists argue that economic liberalism is over and applaud mixed-economy solutions, and reemphasize full employment.

According to ‘liberal’ or ‘neoclassical’ approaches, the argument for increasing the number and/or depth of markets remains. Government bailouts and easy money (inducing excessive risk) caused the crisis, and markets can self-correct.

In contrast to these options, there are technocratic solutions, which are based on the views of the experts who think that neither markets nor states always act properly and need control. Some of them proposed an independent fiscal authority like independent central banks in order to maintain the trust in currency. Others would like to see strict regulatory frameworks because of the evident corruption in financial industry and the common belief that regulators were sleeping at the wheel.

Finally, various proposals are directed towards increasing international coordination of the financial industry. Some support a Tobin tax on currency transactions. Some cite the model of the EU and the Euro. Many groups argued that the liberal model posed a ‘one best way’ that ignored regional differences. In between, there are doubts on autarchy or more global markets; here the idea is to seek coordination in a ‘multi-polar world’. Technocrats also call for greater monetary and trade coordination. Such debates are similar and inevitably essential to problems of financial infrastructure.

At the micro level, second set of measures emphasize the need for new financial stability frameworks that are adaptable to changing conditions in financial markets (Edey, 2009). The difficulties in financial markets today,

with their significant effects on the real economy, indicate that the costs of not having such a framework could be large (White, 2008). Risks are often underestimated at times of expansion, giving rise to a rapid credit growth, asset price bubbles, over indebtedness and excessive spending, and adding to economic growth. However, in bad times (e.g. in a cyclical downturn) these forces work in opposite direction and produce financial fragility by giving rise to defaults, credit crunch, falls in asset values, and contribute to economic contraction (Akyüz, 2008). Therefore, a risk based, more supervisory approach is necessary to set up new financial stability frameworks. This requires better risk management techniques and valuation processes, enhanced stress-testing models, greater transparency of financial products and institutions particularly related to structured products and off-balance sheet activities, and improved information from ratings agencies. Only then the confidence in both financial markets and institutions can be re-established.

## **5. Conclusion**

The crisis began with the problems in the US mortgage industry. But the mortgage industry view of the crisis could not explain the developments following the Lehman's collapse. There was a bubble in real estate prices and the main causes of this bubble were the loose monetary policy of the FED and the global imbalances. The crisis was preceded by a rapid credit expansion. The combination of cheap credit together with the easy availability of funds contributed to the formation of the bubble. The bubble made households feel wealthier and encouraged them to borrow and spend. Many people borrowed to finance consumption. Therefore, economy-wide leverage increased and caused excessive risk-taking on the part of the borrowers.

When the housing market boom turned into a bust, it badly affected both the real economy and the financial system. Because there was a widespread loss in confidence, the global economic conditions were deteriorated. People made wrong decisions on prices for a number of years in the presence of an asset price bubble and there was an uncertainty about future price levels. Since it took a long time to get correct prices, this was damaging to the real economy.

The effects on the financial system emerged before the Lehman's collapse but they intensified after it. The underlying causes were the short-term financing structure of the US financial institutions, interconnected banking system, challenges presented to authorities in face of globalization, weak regulatory structure of the US financial system, banks' reliance on off-balance sheet activities, development of structured products and derivative instruments, limitations of risk management techniques and practices, lack of transparency, high leverage of international banks, and wrong incentive schemes in the banking sector. They altogether aggravated the effects of the crisis.

Significant policy measures were put into action in order to moderate the effects of the crisis and to support demand and economic activity. Although initial signs of immediate policy measures are positive, the speed and strength of the eventual recovery remain uncertain. At the broad level, the second set of measures includes the proposals for a new financial infrastructure. At the micro level, they underline the need for new financial stability models. The success of these measures will depend on the continuing efforts to repair damaged financial markets and institutions in the US and elsewhere, and require cooperation at the global level. However, until now there is very little consensus on what was the cause of the crisis and what needs to be done in order to prevent the occurrence of a similar crisis in the future.

## Notes

<sup>1</sup> Sub-prime loans, in US terminology, are loans that do not meet standard criteria for good credit quality, such as sound credit history on the part of the borrower, good income documentation and/or a conservative loan-to-valuation ratio.

<sup>2</sup> See (Pattanaik, 2009: p. 27).

<sup>3</sup> See (Edey, 2009: p. 186).

<sup>4</sup> See (Allen and Carletti, 2010: p. 5, Figure 1; Carmassi et al., 2009: p. 984, Figure 2; Özatay, 2009: pp. 104-5, Graph 12) for details.

<sup>5</sup> See (Allen and Carletti, 2010: p. 6, Figure 2).

<sup>6</sup> See (Lewis, 2009: p. 117, Table 1).

<sup>7</sup> See (Carmassi et al., 2009: pp. 981-2, Table 1, Figure 1) for details.

<sup>8</sup> See (Allen and Carletti, 2010: pp. 15, 17, Figure 6; Özatay, 2011: pp. 514, 543-4, Graph 1) for details.

<sup>9</sup> See (Edey: 2009, pp. 189-90, Figure 3) for details.

<sup>10</sup> See (Hildebrand, 2008, p. 316) for details.

<sup>11</sup> See (Edey: 2009, p. 194, Figure 7) for details.

<sup>12</sup> IMF's forecasts for the GDP growth rates of the world economy, US, Japan, and EU for 2010 were 4.8%, 2.6%, 2.8%, and 1.7% respectively. Though it revised its world GDP growth rate forecast for 2009 downwards two times. See (Edey: 2009, p. 189, Figure 1; Özatay, 2011: p. 559) for details.

<sup>13</sup> In total, discretionary fiscal measures provided a stimulus of up to 2% of world GDP in 2009. See (Edey: 2009, p. 194, Table 1; Özatay, 2011: pp. 558-9, Table 2) for details.

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