The 2007-2009 Financial Crisis

What Went Wrong and What Went Different?

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To Annabelle, who heroically lived through
the convulsions of the (writing) crisis

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Executive summary

The aim of this book is to discuss the main reasons that lead to the largest financial crisis since the Great Depression as well as to compare the development in the United States with other advanced economies. We are seeking answers to the questions of what went wrong and what went different prior to this crisis in America (why it happened and why it started in the United States).

The latest large financial crisis has been triggered by rising delinquencies and foreclosures on American (initially mostly non-conforming) mortgage loans. There was a huge (but internationally not unprecedented) housing boom in the American property market, which lead to a price bubble and later to a substantial supply overhang. This resulted in falling house prices which became the trigger of the crisis. While US residential property prices were falling (beginning in 2006), an increasing number of borrowing households found themselves in negative equity and reacted by defaulting on their mortgages. As most mortgages had been securitized (i.e. transformed into Mortgage Backed Securities – MBS – and sold to investors in volumes of trillions of dollars), the rising, internationally unprecedented wave of delinquencies and foreclosures lead to a domino effect. Securitization created a chain of risk transfer from original mortgage lenders to MBS investors and insurers. Therefore, defaulting households were just the first domino to fall, followed by mortgage lenders, holders of mortgage-backed securities and their guarantors and insurers. As a matter of fact, a regional problem in the American housing market – through the channels of financial innovation (securitization) – threatened to tear down the whole global financial system.

American mortgage borrowers faced probably the most consumer-friendly environment in the world, they could choose from a wide variety of mortgages with different interest rates and amortization periods, usually with attractive terms and low down payments. American mortgages differed from those in all other advanced countries in two major aspects: (1) it was easiest to refinance a mortgage in the United States, and (2) most mortgages were de jure or de facto non-recourse, secured just by the house as collateral. Borrowers had no personal liability for the debt. These features lead to a decreasing prudence of borrowers prior to the crisis.

The quality of American mortgages originated before the crisis has deteriorated in an unprecedented way. Mortgages in the United States (especially subprime and Alt-A mortgages) were given to borrowers of whom most would have been rebuffed in any other country. A crucial number of American borrowers took mortgages that they – as it turned out later – could not afford (i.e. they did not manage to pay them back). They hoped that house price appreciation would continue and as a result they would be able to easily refinance their existing mortgages, which were very favorable short-term but unaffordable long-term. The continuous appreciation of residential property prices before 2006 masked the looming problems inside mortgage finance (especially in the case of non-conforming loans), but these hidden problems were revealed once house prices started to fall, dramatically limiting the possibility of mortgagors to refinance.

Prior to the financial crisis, the United States of America uniquely became the first country in the world where the majority of housing finance funding came from capital markets, and instead of the traditional depository-based funding (referred to as the *originate to hold model*) securitization became a dominant source of funds for US residential mortgages (referred to as the *originate to distribute model*). In this new model, mortgage loans are sold by their originators to big financial institutions (often parts of the so-called *shadow banking system*) which then transform the pool of mortgages into Mortgage Backed Securities (MBS) or other similar debt securities (a process referred to as 'securitization') and sell them to investors. The cash flows from the mortgages are transformed into cash flows (interest and coupon payments) for security holders, who basically buy the right to receive borrowers' payments. Because of securitization, a growing fraction of financial intermediation migrated outside the traditional banking system to the shadow banking system (also known as the parallel banking system). In America, this system, made up of Government Sponsored Enterprises (GSEs), bank, broker-dealer and asset management subsidiaries and off-balance sheet entities (conduits, SPVs and SIVs) of large financial holding companies and investment banks, significantly surpassed the traditional banking system. Shadow banking was much less regulated and much more fragile and vulnerable than traditional banking because of dangerously high leverage, reliance on short-term funding and a lack of explicit government support (deposit insurance and access to the Fed's

discount window). Not accidentally, the crisis swept away all of its elements which were not bailed out by the government.

Public policies not only failed to prevent the crisis but – on the contrary – they contributed to it. The federal government in fact was leading the way in loosening underwriting and lending practices, expanding securitization and increasing leverage and risk taking in the financial sector. The government policies and failures which most contributed to the crisis can be grouped into three major points: (1) a housing policy which actively supported the origination and securitization of risky mortgage loans with explicit or implicit government guarantees or by other means; (2) a monetary policy which kept interest rates too low for too long, aiming to help the economy to recover from the 2001 recession; and (3) failed regulation of the financial sector, which allowed banks and other actors of shadow banking to engage in risky activities and operate with rising, dangerously high leverage and minimal own equity, and rely on probable government help in case major problems occurred. Political interference created an environment full of moral hazard, much like a casino where bets are guaranteed by the government and gamblers never lose – profits are privatized and losses nationalized.

The processes of deepening globalization played a key role in American economic development, basically enabling the US to live far beyond its means for far too long. The rising influx of cheaper foreign goods, foreign capital and labor – by keeping inflation and interest rates low – helped to prolong the debt-driven boom cycle in the US economy.

The most important causes of the crisis and differences to other advanced economies can be summarized as follows:

- The very favorable mortgage conditions – especially the possibility of non-recourse default on mortgage debt without risking a deficiency judgment – led to decreasing prudence on the side of American borrowers. In all other advanced economies with developed housing finance, mortgage loans are recourse, defaulters face deficiency judgments, lenders can seek not just the collateral (house) but the borrowers' other assets or future income to compensate for the losses from default. This has a strong deterrent effect; outside the United States much fewer people took loans they could not afford, delinquency and espe-

cially foreclosure rates remained also lower once house prices started to fall (in spite of the fact that house price volatility in a number of countries was higher than in America).

- When the crisis started, about 56 % of the outstanding residential mortgages (but over 80 % of newly issued mortgages) were securitized in America. Securitization enabled US mortgage lenders to pass away credit risk and this decreased the prudence on the side of primary lenders. Only in America was it possible for so many people to be awarded with NINJA loans (where mortgagors had no verified income, job or assets) up to 100 % of the price of their property. In all other developed countries, the originate to hold model still remained the dominant form of housing finance, only a minority of mortgages had been securitized. Even when used, securitization was partially different in Europe. European banks issuing covered mortgage bonds kept the mortgage loans on their books and were liable for the bonds. In America, during securitization the mortgage loans were removed from the balance sheets and MBS investors had no claim vis-à-vis the originator (the bank), just against the collateral (the house of the borrower).
- Prior to the financial crisis, the United States had developed the most extensive housing finance policy among advanced economies. Most other developed countries had no mortgage insurance provided by a state institution (such as FHA insurance in America) and no government mortgage securitization or guarantees (like those provided by Ginnie Mae), or government sponsored enterprises (like Fannie Mae and Freddie Mac). Even in those countries which had similar institutions, their market share was significantly lower than in the US. The widespread state interference in American housing finance dramatically increased moral hazard, the strong incentives put up by the government contributed to excessive risk taking by all actors from Wall Street to Main Street.
- The United States was in the best position to exploit the advantages of economic and financial globalization in seeking cheap foreign credit. Its pre-eminent position in the world (the largest power, the issuer of the dominant reserve currency, etc.) ensured the easiest access to the cheapest credit sources available. These sources prolonged the housing and lending boom, enabling America to live far beyond its means for longer.

Introduction

"This time, many analysts argued, the huge run-up in U.S. housing prices was not at all a bubble, but rather justified by financial innovation (including to sub-prime mortgages), as well as by the steady inflow of capital from Asia and petroleum exporters. The huge run-up in equity prices was similarly argued to be sustainable thanks to a surge in U.S. productivity growth, a fall in risk that accompanied the "Great Moderation" in macroeconomic volatility. As for the extraordinary string of outsized U.S. current account deficits, which at their peak accounted for more than two thirds of all the world's current account surpluses, many analysts argued that these, too, could be justified by new elements of the global economy. Thanks to a combination of a flexible economy and the innovation of the tech boom, the United States could be expected to enjoy superior productivity growth for decades, while superior American know-how meant higher returns on physical and financial investment than foreigners could expect in the United States. Next comes reality. Starting in the summer of 2007, the United States experienced a striking contraction in wealth, increase in risk spreads, and deterioration in credit market functioning. The 2007 United States sub-prime crisis, of course, has its roots in falling U.S. housing prices, which have in turn led to higher default levels particularly among less credit-worthy borrowers. The impact of these defaults on the financial sector has been greatly magnified due to the complex bundling of obligations that was thought to spread risk efficiently. Unfortunately, that innovation also made the resulting instruments extremely nontransparent and illiquid in the face of falling house prices."

Carmen Reinhart and Kenneth Rogoff, 2008
(Reinhart, Carmen M. – Rogoff, Kenneth S. (2008): *Is the 2007 U.S. Sub--Prime Financial Crisis So Different? An International Historical Comparison*. NBER Working Paper No. 13761, National Bureau of Economic Research, Cambridge, MA, p. 3 – 4.)

From time to time, during the years of economic booms, economists, politicians and the general public quite often tend to be too optimistic about future prospects, believing that the growth can last indefinitely while underestimating the possibility of crisis. This is happening in spite of the fact that economic history teaches us

the opposite: sooner or later every growth ends, every bubble bursts, every boom is followed by bust and the optimist "bullish" mood is replaced by pessimist "bearish" behavior at the markets. The latest large financial and economic crisis which began in 2007 was no exception. Prior to the crisis only a few economists (and non-economists) sounded the alarm bell, warning their (mostly skeptical) audience that US economic growth was not balanced and therefore unsustainable, and that Americans were living far beyond their means for too long.[1] According to Reinhart and Rogoff ((2008/b): 5), sovereign debt default, one of the major parts of financial crises, has been the norm and not the exception during the financial history of the world. It is just the relative stability during the periods between the defaults that creates the false illusion that "this time is different": "*The problem is that crisis-prone countries, particularly serial defaulters, tend to over-borrow in good times, leaving them vulnerable during the inevitable downturns. The pervasive view that "this time is different" is precisely why it usually isn't different, and catastrophe eventually strikes again*" (Reinhart – Rogoff ((2008/b): 33). Thus, instead of learning from their – and their predecessor's – mistakes, policymakers and investors rather tend to forget and repeat these mistakes: "*Technology has changed, the height of humans has changed, and fashions have changed. Yet the ability of governments and investors to delude themselves, giving rise to periodic bouts of euphoria that usually end in tears, seems to have remained a constant*" (ibid. p. 53). We can apply this approach not just to sovereign debt defaults but generally for all financial crises. It is staggering that prior to the latest meltdown, only a few gave attention to the striking similarities between the development in America before 2007 and development in other countries which led to previous crises. Partially this ignorance could be explained by the fact that America had not witnessed a large financial crisis since

1 The best known economist who – very precisely – predicted the crisis was Nouriel Roubini, a professor of economics at New York University. In their book, Roubini and his co-author Stephen Mihm provide a short list of those economists who warned about the unsustainability of the growth and the risk of financial crisis (Roubini – Mihm (2010): 1 – 3). The final report of the (Congressional) Financial Crisis Inquiry Commission provides a much longer list of economists, industry specialists, real estate appraisers, managers, bankers, public officials, lawyers, attorneys, members of various advocacy groups, etc., who warned about the dangers inside mortgage finance (FCIC (2011): 4 – 22).

the Great Depression and that it had enjoyed almost two decades of economic growth (interrupted by just one short and mild recession in 2001). In most advanced economies, the pre-crisis era was a period of low inflation, low interest rates and relatively high growth combined with calm in global financial markets (which followed a range of devastating financial crises in the emerging markets during the 1990s). This prosperous and calm period started to be referred to as the era of "Great Moderation" in the world economy. "*As a result, mainstream economics has either ignored crises or seen them as symptoms of troubles in less developed economies*" (Roubini – Mihm (2010): 7). However, during this era the development in America (considering many economic indicators) followed the path of countries which went bust previously. Reinhart and Rogoff ((2008/a): 1) found stunning qualitative and quantitative parallels to 18 earlier post-war banking crises in industrialized countries.[2] US housing and equity prices, public debt, real growth and current account deficits showed similar development as the average of 18 countries before their crises. (The run-up of equity and housing prices was higher, the slowing of real growth and the buildup in public debt somewhat lower but the rise of the current account deficit much higher than the average.) The same authors differentiated four major types of financial crises (Reinhart – Rogoff (2009): xxvi): (1) sovereign default – a government fails to meet payments on its external or domestic debt obligations or both; (2) banking crisis – a significant part of a nation's banking sector becomes insolvent after heavy investment losses, banking panics (bank runs) or both; (3) exchange rate crisis – the value of a country's currency falls precipitously, often despite a government "guarantee" that it will not allow this to happen under any circumstances; and (4) very high inflation – large and unexpected increases in inflation

2 The data from pre-crisis America were compared with the average of eighteen bank-centered financial crises from the post-War period. These were the following (the starting year is in parenthesis): *The Big Five Crises*: Spain (1977), Norway (1987), Finland (1991), Sweden (1991) and Japan (1992); and *Other Banking and Financial Crises*: Australia (1989), Canada (1983), Denmark (1987), France (1994), Germany (1977), Greece (1991), Iceland (1985), Italy (1990), New Zealand (1987), the United Kingdom (1973, 1991, 1995), and the United States (1984). The "Big Five" crises are all protracted large scale financial crises that are associated with major declines in economic performance for an extended period. The remaining rich country financial crises represent a broad range of lesser events (Reinhart – Rogoff (2008/a): 4 – 5).

making all debtors (including the government) repay their debts in a currency that has much less purchasing power than it did when the loans were made. (If the government is using the "printing press" way of inflating away its debt, high inflation is the de facto equivalent of sovereign debt default.) These different crises mostly do not occur separately but rather they come in clusters and usually do not stop at the borders. They are also pretty much interlinked; one type of crisis can fuel the other one. A typical example could be a major banking crisis: public debt rises sharply after a crisis [3] (due to bank bailouts and credit contraction, which leads to economic downturn and therefore declines in tax revenues and increases in government spending) and the government might find it impossible to repay the debt. A banking crisis turns to sovereign debt default, and the insolvency of the large part of the financial sector leads to the insolvency of the government. It may react with official default and debt restructuring or start up the printing press, resulting in very high inflation (de facto default). In both cases the exchange rate of the national currency is likely to collapse or at least significantly depreciate. With this, all four types of the crises are together now. During the last two centuries, the frequency of sovereign defaults was much lower in advanced economies (where these events were rather exceptional) than in emerging markets, but the frequency of banking crises was relatively high and similar in both the cases of advanced economies and emerging markets (ibid. 147 – 153). While the causes of sovereign defaults are quite clear (overspending – throughout history usually because of war expenditures – and resulting in unsustainable levels of government debts), the causes of a banking crisis are a much more complicated issue. As the latest financial crisis was a banking crisis (at least in most of the countries including America); we will concentrate on the general theoretical explanations of the origins of a banking crisis.

The starting point of a banking crisis is usually a burst of an asset price bubble which follows a previous boom financed with expanding credit. During this boom, price gains (of some assets) in at least one important part of the economy lead to future profit expectations. This results in an increased flow of money to that sector as many more are looking for profit trying to make their fortune.

3 Reinhart and Rogoff ((2009): 170) calculated that on average, government debt rises by 86 % during the three years following a banking crisis (based on data from major postwar crises).

This inflow of new money leads to additional price gains, further increasing future expectations, and a self-sustaining bubble forms. Price increases are fuelled more and more by the incoming stream of investment and not by the expectations based on underlying fundamental values (based upon the net present value of future cash flows). This bubble alone would not create a financial crisis, the problem is that investments to assets are increasingly financed with cheap credit; the rise of the bubble goes hand in hand with rising indebtedness. John Stuart Mill as early as in 1848 recognized (in his famous *Principles of Political Economy*) that during the formation of the bubble "*a great extension of credit takes place. Not only do all whom the contagion reaches employ their credit much more freely than usual; but they really have more credit, because they seem to be making unusual gains, and because a generally reckless and adventurous feeling prevails, which disposes people to give as well as take credit more largely than at other times, and give it to persons not entitled to it*" (cited by Roubini – Mihm (2010): 44). Charles Kindleberger in his classical book (*Manias, Panics and Crashes: A History of Financial Crises*) describes a model of crisis, differentiating between its various stages. At the start of the boom there is some kind of macroeconomic shock – later called "displacement" by Hyman Minsky. It must be large and pervasive enough to significantly increase the profit opportunities in at least one economic sector while simultaneously reducing opportunities in other areas, thus shifting the stream of investment and credit to the new area to start an investment boom ("mania" or "euphoria"). The external shock to the economy can take different forms: war or the end of war, good or bad crops, a new innovation or technology and its diffusion to the economy (for example new canals, railways, discoveries of new routes, countries or silver or gold mines). As new opportunities open up, people move to take advantage of them, booming prices lead to euphoria and speculation on price increases becomes common. Investors can behave completely rationally on an individual level; however, as a herd their behavior is an example of "mob psychology". During the mania, the rush of new investment and credit creates a self-sustaining bubble (a positive feedback loop). The list of the objects of speculation is endless: securities, stocks, canal and railway manias, imported commodities, exports of manufactured goods, building sites, public land, mortgages, housing, foreign exchange, commercial real estate, shopping centers, loans, money funds and so on (Kindleberger (2006): 272). At the height of speculation, a few insiders – in the belief that the boom has reached its peak – begin to sell their assets, leaving the overheat-

ed market and turning to "safe" investments. Specific events (bank failures, corporate bankruptcies or various scandals) can signalize to the investors that the game is about over. As sellers outnumber the buyers, prices begin to fall and the panic starts. Investors trying to escape from the speculation and save what they can desperately sell their assets, causing prices to collapse. Banks also run after their loans (many of which are lost because they were invested in overvalued assets) and usually halt lending; a "credit crunch" follows. After a painful adjustment process – including a recession or even a depression – the market stabilizes and returns to an equilibrium. Soon or later some new investment opportunities appear on the horizon, and a new displacement, a new boom and bust cycle can start.

In Hyman Minsky's Financial Instability Hypothesis, business cycles, credit and asset price bubbles and instability originate from the financial system, which is the fundamental part of a modern market economy; a financial crisis is therefore an inherent and inevitable feature of the capitalist system (Minsky (1992): 8). As investors many times use borrowed money, this theory tries to figure out the impact of debt, which tends to expand in good times followed by credit detraction during a crisis. This would not be a new observation, but Minsky divided the debtors into three different categories: hedge borrowers (those who can fulfill both their interest and principal payments from their cash flow), speculative borrowers (those who can cover the interest payments but not the principal) and Ponzi borrowers (their income covers neither the principal nor the interest payments). "*In particular, over a protracted period of good times, capitalist economies tend to move from a financial structure dominated by hedge finance units to a structure in which there is large weight to units engaged in speculative and Ponzi finance*" (Minsky (1992): 8). As Ponzi borrowers need to borrow more to cover interest and principal payments, they rely only on future asset price rises; if asset prices fall, they will be unable to meet their debt payments and thus go bankrupt, but speculative borrowers will follow them too if the decline in prices is large and prevailing. And usually it is, as not only is the buildup of the bubble self-sustaining but also the burst of it. Loans are usually secured by assets and during the boom cycle asset prices are rising, so investors can borrow (or banks can lend) more against these assets; this leads to further increase of demand and prices, thereby creating a positive feedback loop (Buckley (2011): 124). During the boom, banks increase their leverage (the ratio of a company's debt to its equity, i.e. to that part of its total capital that

is owned by its shareholders). If they increase lending or investment, they do it mostly from borrowed funds (and not by increasing their own capital) and so they also increase their liabilities, which therefore increases leverage. However, this also increases the fragility of the whole financial system; banks themselves become more and more speculative or even Ponzi borrowers. When the bubble bursts and asset prices start to decline this leads to the reversal of the feedback loop. Investors are not able to borrow more; instead of this, many of them are forced to sell their assets to repay their loans. Asset sales and credit losses leading to further asset sales (as banks try to recover their losses at least partially) lead to a further drop in asset prices, starting a new round of asset sales, deleveraging and credit contraction which seriously weakens economic activity.

To make the things even more complicated one has to take into account also the liabilities of the banking sector. The vast majority of bank lending is not financed with the money (capital or shareholders' equity) of the banks but from borrowed funds: traditionally retail deposits but also increasingly various types of securities and commercial paper sold at financial markets. The most important role of the banks is financial intermediation: they borrow the money from those who have it (and do not need it at that moment) and lend it to those who need it. The difference between the interest they charge (from the borrowers) and the interest they pay (to their lenders who provide the funds) is their profit. "*Banks borrow money in order to lend it; the difference between the rate of interest that is paid to them and the rate that they pay, less their working expenses, constitutes their profit on this kind of transaction. Banking is negotiation between granters of credit and grantees of credit. Only those who lend the money of others are bankers; those who merely lend their own capital are capitalists, but not bankers*" (Mises (1953): 262). During the burst of asset price bubbles (for example, the crash of property or stock prices) banks face various challenges: (1) a great chunk of the money they lent was invested in assets, or many loans they gave were secured with assets. If asset prices fall, banks will have losses on their investment and loans. If these losses are higher than the equity of the bank, the bank (in the absence of a bailout) will be insolvent, it cannot meet all of its liabilities: in other words, it is bankrupt. (2) There is a maturity mismatch between the liabilities of the bank and its assets (loans and investments): while the liabilities are liquid and usually short-term (demand deposits and short term commercial paper sold to investors), the assets are highly illiquid and long-term (20 – 30 year mort-

gage loans, loans invested in company equipment or in 5 – 10 year bonds, securities and other things that cannot immediately be turned into cash). "*Normally this disparity isn't a problem; it's highly unlikely that all the depositors will rush to the bank at once, demanding their money back. But occasionally they do precisely that, and the Great Depression is the example of what happens when panicked depositors flood a bank*" (Roubini – Mihm (2010): 77). During the burst of asset price bubbles the confidence of depositors and investors in banks can decline (especially if they know that the bank invested heavily in those assets and/or lent many loans that were secured by those assets). Investors can refuse to roll over the short-term debts of the banks; depositors might rush to the banks in panic withdrawing their deposits *en masse*. This will force the bank to liquidate its assets quickly, even at fire sale prices, just to get the cash it needs, and its survival is still questionable. (The liquidation of bank assets at fire sale prices will give an additional impetus to the reverse feedback loop of asset sales, deleveraging and credit contraction.) Without outside help (usually from investors or the government), a large part of the banking sector is likely to collapse with serious consequences for the whole economy. That is why in modern economies many new institutions were created to avoid bank runs and save the banking sector from collapse. Governments (or various agencies, funds set up by the government) provide deposit insurance (usually up to a certain limit) to prevent the panic of depositors and bank runs. Central banks work as creditors of last resort; they are able to provide the necessary liquidity for commercial banks in case of temporary illiquidity, and so the banks are not forced to sell assets at fire sale prices during times of financial panic and upheaval. Governments can bail out banks, saving them from insolvency and assisting in their liquidation or restructuring. All these instruments can contain the spread of financial panic and the transformation of a financial crisis into a severe depression.

But this is still not the end of the story, at least not from the perspective of Austrian economists. According to their school of thought, the commercial and central banks (but partially also the governments) are not just the victims of bursting asset price bubbles but the main creators of them. They are able to create money, increase the money supply and finance the asset price bubbles. Commercial banks can do it by issuing fiduciary media because of the so-called 'fractional reserve banking' (the banking system used for a long time in capitalist economies). Central banks can literally print (fiat) money and increase the money sup-

ply as they wish (since the money is not backed by any gold or other precious metals as in the era of the gold standard or before then). Governments can step in to this mismanagement with their guarantees and bailouts dramatically increasing the incentives for moral hazard among financial institutions and investors. The first of these innovations to evolve was fractional reserve banking. Huerta de Soto (2006) provides a monumental historic overview on how banks failed to meet 100 % reserve requirements on demand deposits from ancient times through the Middle Ages up to the era of modern banking in 19th century Britain and how this behavior repeatedly led to credit boom and bust cycles resulting in the collapses of large banks in all but one case (the Amsterdam Exchange Bank).[4] According to the traditional principles of law, 100 % of demand deposits should be kept in the safes of the banks because they were just deposited and the bank should pay the whole amount on demand to the owner. In theory, the bank is able to do this only when it keeps the whole amount of these deposits in its safes. (On the contrary, in the case of time deposits – which are effectively loans from depositors to the bank because the depositors agree that they will demand their money back only after a certain period of time – banks can lend this money to their customers and do not have to keep it in their safes). However, as it is highly unlikely that all depositors will demand their money at once, banks throughout history have learned that in practice they also can lend most of the demand deposits to borrowers and keep just a fraction of them in their safes in liquid forms to cover the daily turnover (hence the phrase 'fractional reserve banking'). This practice was stretched to breaking point in recent times all

4 Since it was established in 1609, the Amsterdam Exchange Bank (Wisselbank) has maintained (approximately to the end of the 18th century) a 100 % (or at least near to 100 %) ratio between its deposits and its metallic reserves (precious metals and coins). Illiquidity because of a bank run was therefore impossible, since it had enough cash (gold and silver) to satisfy all depositors (or almost all of them) at once: this is why the bank has remained incredibly stable (and internationally well-known with a very good reputation) for a very long time (almost two centuries). It was the last large bank in history to apply a 100 % reserve ratio, all the others then and since have practiced fractional reserve banking (See Huerta de Soto, Jesús (2006): *Money, Bank Credit, and Economic Cycles.* 2nd Chapter and Ferguson (2008): 48 – 49).

across the advanced economies with developed financial systems. Joshua N. Feinman (1993) provided a historical overview of reserve requirements (set by the government for commercial banks) in America which showed the decline of these requirements from around 15 – 25 % in 1863 to just 10 % (for "transaction" i.e. mostly demand deposits) and 0 percent (for time deposits) by 1992.[5] Prior to the latest crisis, the cash reserve ratio (ratio of cash reserves to all deposits) of American or British banks declined to around a mere 1 percent (Buckley (2011): 57 – 58). A banking system based on the principles of fractional reserve banking is able to increase the money supply by creating money (credit) *ex nihilo*, from thin air. For instance, if 90 percent of the money put on demand deposits is lent out by the banking system, a 100 million increase in the amount of these deposits leads to an increase in money supply of 90 million (the amount of new credit money that flows into the economy). But this is not the end as part of this increase will end up in current accounts in the form of new demand deposits and part of it is given to new borrowers, leading to an additional increase in money supply. This phenomenon is called the 'money multiplication effect'. If the multiplier is for example 2, this means that an initial increase of 100 million in demand deposits will increase the supply of money by 200 million. The existence of fractional reserve banking which creates fiduciary media has at least two major consequences: (1) banks become fragile and vulnerable to bank runs; if an unusually high part of depositors demands its money from the banks, the financial system is likely to face a liquidity crisis. (2) The ability to create money can lead to credit boom and bust cycles (credit expansion and credit contraction), in other words, to high volatility of the money supply, which influences the business cycles in the economy. If markets are awash with money created and multiplied by the commercial banks, asset price bubbles can rise and rise; it is the world of finance which creates the bubble. These dangers were well known in Europe and America at least since the mid-19th century; government policies have been guided "*by the idea that it is necessary to*

5 Throughout history different reserve requirements existed in the US for different types of deposits (time or demand deposits) and different types of banks (for example members and non-members of the Federal Reserve System). In 1863, with the passage of the National Bank Act, national banks had to hold a 25 percent reserve against both notes and deposits (Feinman (1993): 4).

impose some sort of restriction upon the banks in order to prevent them from extending the issue of fiduciary media in such a way as to cause a rise of prices that eventually culminates in an economic crisis. But the course of this policy has been continually broken by contrary aims"[6] (Mises (1953): 367). Rather than introducing efficient restrictions to fractional reserve banking, the countries with developed financial sectors established central banks as creditors of last resort which are able to provide practically endless lines of credit to commercial banks to contain the liquidity crisis. They do so by creating fiat money, i.e. literally printing it. Here we are getting to the third type of money. Mises in *The Theory of Money and Credit* differentiated three types of money: (1) commodity money is that sort of money that is at the same time a commercial commodity (over history usually gold and silver) – this commodity would have a value even when it is not used as a medium of exchange; (2) credit money – here he refers to the fiduciary media created by commercial banks operating on the basis of fractional reserve banking; and (3) fiat money, which comprises things with a special legal qualification (e.g. the government declares

6 The best known attempt to restrict the banks in creating fiduciary media was the Peel's (Banking) Act of 1844 in Britain. It prohibited the issuance of unbacked notes (i.e. banknotes not backed by precious metals) by commercial banks. (At that time in Britain – as well as in most countries – the government/central bank had no monopoly over the issuance of banknotes.) But it forgot to forbid the lending out of demand deposits. "*Nevertheless, something was overlooked in the calculations of the Currency Theorists. They did not realize that unbacked deposits were substantially the same as unbacked notes, and so they omitted to legislate for them in the same way as for the notes. So far as the development of fiduciary media depended on the issue of notes, Peel's Act completely restricted it; so far as it depended on the opening of deposit accounts, it was not interfered with at all. This forced the technique of the English banking system in a direction in which it had already been urged in some degree by the circumstance that the right of note issue in London and its environs was an exclusive privilege of the Bank of England. The deposit system developed at the expense of the note system. From the point of view of the community this was a matter of indifference because notes and deposits both fulfill the same functions. Thus Peel's Act did not achieve its aim, or at least not in the degree and manner that its authors had intended; fiduciary media, suppressed as bank-notes, developed in the form of deposits.*" (Mises (1953): 370)

by law that it is a legal medium of exchange) which do not differ technologically from other objects that are not money (ibid. 61). Technically, the current banknotes used by us are just a piece of paper, only their legal qualification given by the governments defines them as money. Technically, governments/central banks can issue (print) as much of these notes as they wish, practically only the dangers of increasing inflation and depreciation against other currencies function as barriers to this way of increasing money supply. While during the 19th century and up to the First World War – especially in the era of the gold standard – the first two types of money were dominant, during the last decades (definitely from the collapse of the Bretton Woods monetary system in 1971-73) money supply is made up of the last two types of money. From the Austrian perspective, the combination of fractional reserve banking and fiat money issuance by central banks can dangerously increase the money supply and this is the major force behind asset price bubbles. When the bubble bursts, government interference just makes things worse.

"Austrian School economists make a historical case that the policy response to the recent crisis will eventually give us the worst of all worlds. Instead of letting weak, overleveraged banks, corporations, and even households perish in a burst of creative destruction, thereby allowing the strong to survive and thrive, governments around the world have meddled, creating an economy of the living dead: zombie banks that cling to life with endless lines of credit from central banks; zombie firms like General Motors and Chrysler that depend on government ownership for their continued survival; and zombie households across the United States, kept alive by legislation that keeps creditors at bay and that spares them from losing homes they could not afford in the first place. In the process, private losses are socialized: they become the burden of society at large and, by implication, of the national government, as budget deficits lead to unsustainable increases in public debt. In time, the assumption of these crushing debts can strain government finances and reduce long-term economic growth. In extreme cases, this kind of burden will lead the government to default on its debt, or alternatively, to start printing money to buy back its debt, a maneuver that can swiftly trigger bouts of dangerously high inflation " (Roubini – Mihm (2010): 55).

Further criticism of central bankers' monetary policy springs from the fact that they largely ignore asset price bubbles. In recent years Western central banks were attempting to control consumer price inflation but not asset price inflation. This is an important paradox of our age as central banks are focusing on the management of inherently stable goods markets (controlling the prices of goods), while they mostly ignore inherently unstable capital markets and let the credit booms and asset price bubbles develop (Cooper (2008): 140, 163 – 164). Even if central banks reacted, they did it asymmetrically: during the credit expansion and asset price boom their response was weak and delayed, but during the contraction phase it was violent and early (ibid. 138). The immediate result in 2008 – 2010 was the above described 'zombie economy' kept alive with massive monetary injections from the American government and central bank (Fed). Austrian school economists would eliminate fractional reserve banking (introduce 100 percent reserve requirements for demand deposits) or the ability of the central banks to print fiat money (by reintroducing a poor gold standard for example) or both (Huerta de Soto, 2006). If this goes hand in hand with the elimination of government bailouts, it could be just better from their perspective. The leading monetarist Milton Friedman did not support the elimination of fractional reserve banking or the abolition of the central bank, but he shared the skepticism toward government intervention. In their *Monetary History of the United States, 1867 – 1960*, Friedman and Anna Schwartz blamed the Fed for failing to fulfill its main mission, i.e. to act as lender of last resort during the Great Depression: one-third of the banks had gone out of existence through failure or merger between 1929 and 1933, leading to the fall in stock of money (money supply) by one-third – the largest and longest decline on record (Friedman – Schwartz (1993): Chapter 7). The impotence of the Fed deepened and prolonged the depression: "*Had the money stock been kept from declining, as it clearly could and should have been, the contraction would have been both shorter and far milder*" (Friedman (2002): 50). Friedman and Schwartz also emphasized that the fluctuation in the stock of money, prices and economic output was higher after the establishment of the Federal Reserve System (1914) than before it (even if the large wartime increases are excluded). "*The blind, undersigned, and quasi-automatic working of the gold standard turned out to produce a greater measure of predictability and regularity – perhaps because its discipline was impersonal and inescapable – than did deliberate and conscious control exercised within institutional arrange-*

ments intended to promote monetary stability" (Friedman – Schwartz (1993): 10). This is the main reason why Friedman rather proposed a constant increase in money supply (by 3 to 5 percent a year) by legislative rule (Friedman (2002): 54). Stable rules instead of unpredictable decisions of people might ensure greater stability for the system according to him.

Based on the explanations of economic theories presented above,[7] the nature and development of financial crises could be summarized as follows:

- A boom phase of the boom and bust cycle begins with a macroeconomic shock ("displacement"), significantly increasing profit opportunities in at least one sector of the economy. Approximately from the 1990's, technical and financial innovation increased the potential profit of investments in information technologies and the Internet, as well as in construction, housing finance and related financial derivatives.
- The banking sector and/or the central bank with creating fiduciary media and fiat money significantly increase the money supply providing the necessary funds fuelling price increases. The inflow of money to the sector creates a self-sustaining price bubble[8], the investments are increasingly financed from credit, the indebtedness (of the people and companies) and leverage in the financial sector is rising. From 2001 the Fed rad-

7 Based mostly on: Buckley, Adrian (2011): *Financial Crisis. Causes, Context and Consequences.* Pearson Education Limited, Harlow, England, pp. 121 – 124.

8 The typical characteristics of a bubble can be summarized as follows: rapidly rising prices and a high expectation of future price rises; overvaluation compared to historical averages and reasonable levels; several years leading up to an economic upswing; some underlying reason for higher prices, including a new element (e.g. technology for stocks or immigration for housing); a subjective "paradigm shift"; new investors and entrepreneurs in the area; considerable popular and media interest; a major rise in lending; an increase in indebtedness; new lenders or lending policies; consumer price inflation being often subdued (so central banks are relaxed); relatively low real interest rates; falling household savings rates; and 'positive animal spirits'. Of course, all characteristics listed do not have to be present to drive a bubble, but most would likely be there. (Buckley (2011): 122)

ically decreased the targeted federal funds rate and the leverage of the financial sector also increased significantly. The rising inflow of foreign capital offered additional resources. The expansion of mortgage lending, the housing boom and rising indebtedness followed.

- The mania/euphoria is well under way. Stories of spectacular profit (the media is usually full of these stories and advertisements on unique opportunities as well) attract more investment, new investors with no previous experience join the market place. Various actors (from households to investment bankers and fund managers) are taking bigger and bigger risks. The number of speculative and Ponzi borrowers increases. In the US, mortgages with little or no down payment, very favorable initial "teaser" rates and without the necessary verification of income, job or assets became commonplace after 2000. Liar loans and predatory lending were on the rise. The central bank and the government let the asset price bubble rise and there is no serious monetary or fiscal tightening attempting to prick the bubble. Only a few economists and industry specialists are questioning the nature and sustainability of the growth and warning about the dangers of development. Very few listen to them; the majority is arguing that "this time is different", many are talking about a "new paradigm".
- The start of the bust; there could be various causes of the crash and panic. A few insiders could leave the market, believing that the boom has reached its peak. Scandals reveal previous fraudulent practices and scams; corporate failures question the stability and the sustainability of the growth.[9] Negative news about the local or world economy and declining corporate profits can increase the uncertainty of investors. Asset prices can start to fall. The economy might get overheated and rising inflation can force the central bank to raise interest rates

9 The greatest fraud this time imploded at the end of 2008 with the collapse of the Ponzi scheme run by Bernard Madoff's Madoff Investment Securities LLC in New York. The amounts missing from clients accounts (inclusive of fictitious gains) amounted to a staggering $65 billion, the trustee appointed by the court put actual losses at $18 billion. In June 2009, Bernard Madoff (charged with securities fraud, investment advisor fraud, mail fraud, wire fraud, money laundering, false statements, perjury, making false fillings with the SEC and theft) received 150 years imprisonment (Buckley (2011): 128 – 130).

tightening credit. From around 2006, declining residential property prices in America became the main trigger of the last crisis. However, other causes were also present: frauds and scams were revealed, corporations went into bankruptcy or were saved with mergers and acquisitions; some insiders quit the market before the storm hit.[10]

- Prices are falling; the reversal of the feedback loop is under way. Investors are desperately trying to leave the market. Banks tighten credit and try to recover their losses at least partially; this leads to a further drop in asset prices, starting a new round of asset sales, deleveraging and credit contraction. A large part of the financial sector is in liquidity crisis, a credit crunch follows, interbank lending is frozen, bank runs might occur. Without the help of the central bank and the government, many banks are likely to collapse. (For a more detailed view on bank and corporate failures and bailouts during the last crisis see the timeline of its events in the annex.) Credit contraction together with the collapse of economic activity in the crisis-hit sector (during the last period, mainly housing) leads to an overall decline in production (recession or depression) and increasing unemployment. The

10 "*Paul McCulley, a managing director at PIMCO, one of the nation's largest money management firms, told the* [Financial Crisis Inquiry] *Commission that he and his colleagues began to get worried about "serious signs of bubbles" in 2005; they therefore sent out credit analysts to 20 cities to do what he called "old-fashioned shoe-leather research," talking to real estate brokers, mortgage brokers, and local investors about the housing and mortgage markets. They witnessed what he called "the outright degradation of underwriting standards," McCulley asserted, and they shared what they had learned when they got back home to the company's Newport Beach, California, headquarters. "And when our group came back, they reported what they saw, and we adjusted our risk accordingly," McCulley told the Commission. The company "severely limited" its participation in risky mortgage securities*" (FCIC (2011): 4). Warren Buffett's Berkshire Hathaway also left the market of financial derivatives years before the crisis: "*When Berkshire purchased General Re in 1998, we knew we could not get our minds around its book of 23,218 derivatives contracts, made with 884 counterparties (many of which we had never heard of). So we decided to close up shop. Though we were under no pressure and were operating in benign markets as we exited, it took us five years and more than $400 million in losses to largely complete the task*" (Buffett (2009):17).

fiscal costs of the recession and bank bailouts significantly increase the public debt: in the case of some countries to the extent that they become bankrupt themselves (sovereign debt default) unless they are saved by other countries and/or international organizations (IMF). It can take several years for the economy to return to growth, for employment to increase and for the fiscal burden of the crisis to start to decline.

In the following chapters we will try to explain the causes of the last financial crisis. For a better understanding we analyze the development in international comparison looking for similarities and differences between America and other advanced countries. This is also to explain why the financial meltdown started in the United States. In seeking answers to the questions (in the title) of what went wrong and what went different prior to the last crisis, we grouped the explanation into five chapters: the first is to describe the housing bubble that has developed in America and the burst of it which became the trigger of the meltdown. The next chapter is devoted to mortgage finance (the credit fuelling the housing bubble), showing the process of unprecedented degradation in the quality of loans and explaining the incentives behind it from the borrower's perspective. The third chapter analyzes the decreasing prudence on the lenders' side and the role of financial innovation (securitization) and new players on the market (shadow banking) in this process. The fourth chapter looks at the role of government actions and inactions (housing policy, monetary policy and financial regulation) that contributed to the development of the crisis. In the last chapter we explain how the processes of globalization (especially rising capital and labor flows to the United States) helped to increase and prolong the debt-driven boom cycle in the American economy.

Chapter 1

The housing boom encouraged by the perception of "safe" investment

"Never before have real house prices risen so fast, for so long, in so many countries. Property markets have been frothing from America, Britain and Australia to France, Spain and China. Rising property prices helped to prop up the world economy after the stockmarket bubble burst in 2000. What if the housing boom now turns to bust? According to estimates by *The Economist*, the total value of residential property in developed economies rose by more than $30 trillion over the past five years, to over $70 trillion, an increase equivalent to 100 % of those countries' combined GDPs. Not only does this dwarf any previous house-price boom, it is larger than the global stockmarket bubble in the late 1990s (an increase over five years of 80 % of GDP) or America's stockmarket bubble in the late 1920s (55 % of GDP). In other words, it looks like the biggest bubble in history... Since 1997, home prices in most countries have risen by much more in real terms (ie, after adjusting for inflation) than during any previous boom. (The glaring exceptions are Germany and Japan, where prices have been falling.) American prices have risen by less than those in Britain, yet this is still by far the biggest boom in American history, with real gains more than three times bigger than in previous housing booms in the 1970s or the 1980s."

The Economist, 2005
(*In come the waves. The global housing boom. The worldwide rise in house prices is the biggest bubble in history. Prepare for the economic pain when it pops*. The Economist, June 16th 2005.)

The 2007 – 2008 global financial and economic crisis started in the United States with credit losses on mortgage loans due to the rise in delinquencies and foreclosures on (mostly subprime) mortgages. These problems were also the indicators of the burst of the housing market bubble which followed the long period of the mortgage-fi-

nanced property boom. Over this period housing prices – as well as the outstanding residential mortgage debts – were continuously rising and at the end of the period (approximately from 2000) at a significantly higher rate than the personal income of US households. After this time the housing sector entered into a self-reinforcing boom cycle when more and more investment streamed there, leading to further rises in real estate prices, which attracted even more money and which resulted in an additional rise in prices and construction activity.

At that time the overwhelming majority of Americans considered real estate as the best investment and expected property prices to increase in the future. For example, in the 2003 Fannie Mae National Household Survey two thirds of respondents agreed that it was a good time to buy a home and 61 % considered it a "safe investment with a lot of potential" – only 12 % thought the same about stocks (Fannie Mae (2004): 4 – 5). In the same survey, 84 % of respondents stated that the major reason for buying a home was that it was a good long-term investment. The lost confidence in stocks could be explained by the bursting of the dotcom bubble (the collapsing prices of stocks mostly in the technological sector), the resulting crash on the American stock exchanges in 2000; while the popularity of real estate by very favorable financing conditions (a wide scale of mortgages available at historically low interest rates) and with continuous appreciation in property prices. However, this widespread belief of property being the best investment and as "safe as houses" was just a perception. As Ferguson ((2008): 261) pointed out, a $100 000 investment on the US property market in the first quarter of 1987 over the next 20 years made a roughly three-fold return of $275 000 (according to the Office of Federal Housing Enterprise Oversight home price index) or $299 000 (according to the Case-Shiller national home price index), but the same investment into stocks (measured by the S&P 500 benchmark US stock market index) when assuming the continuous reinvestment of the dividends would have ended up being more than double – a $772 000 return.[11] Obviously, for most Americans the memories of the stock market crash were very strong; on the other hand, they

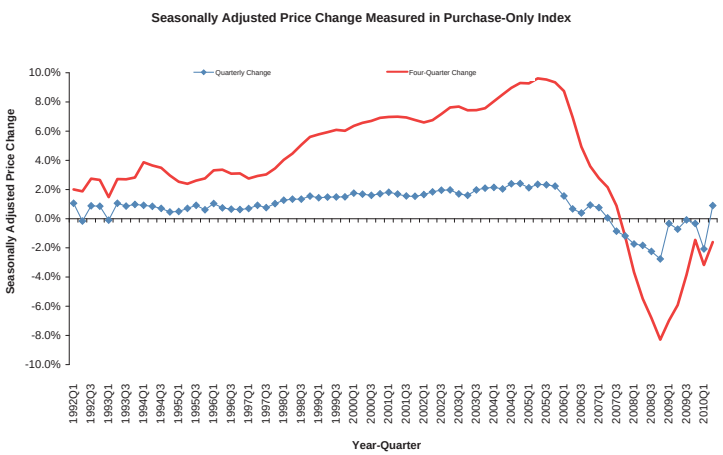
11 Of course the situation is bit more complicated as several other things could be considered. As it is not possible to live in stocks, in order to make a fair comparison the rent (saved or earned) should be included or both the rent and the dividends excluded. However, in both cases an investment in stocks still beats one in houses although with a smaller difference (Ferguson (2008): 261 – 262.)

didn't remember any major drop in house prices. This was a real observation, since basically America had not witnessed a large nationwide drop in house prices since the Great Depression of the 1930s, let alone the fact that stock prices proved to be much more volatile than property prices:

"There is a simple reason why people believed that house prices would not fall. Over the period 1975 through the third quarter of 2006 the OFHEO [Office of Federal Housing Enterprise Oversight] index of house prices (one that measures prices for the same dwelling in many metropolitan markets) hardly ever dropped. In nominal or current dollar terms it fell in very few quarters and only in 1981-82 did it fall to any significant extent. That was the period of the worst recession in postwar history, and even then the price index only fell by 5.4 percent." (Baily et al (2008): 10)

From 1992 to the fourth quarter of 2007 the Federal Housing Finance Agency's (FHFA) House Price Index for the USA increased in every single quarter, when compared to the same quarter in the previous year (FHFA (2009): 4 – 5). According to this index, between the third quarter of 2002 and the second quarter of 2006 annual house price appreciation reached 7 to 9.6 percent.

Figure 1: **FHFA House Price Index History for USA**



Source: **FHFA – Federal Housing Finance Agency (2010):** *House Prices Rise in Second Quarter.* News Release, FHFA, Washington, D.C., p. 5.

The other leading measure of US home prices, the Standard & Poor's Case-Shiller Home Price Indices, shows a similar development.[12] House prices according to the 20-City Composite Home Price Indices (which covers the development in 20 large MSAs – Metropolitan Statistical Areas – all across America) experienced a steady rise at a rate of over 7 percent annually between 2002 and 2006 but entered a free fall in 2007 and stabilized only in 2010 (Standard & Poor's (2010)). Based on the same measurement, as of July 2010 thanks to the 3.2 % annual rise average home prices across the United States were back to the levels where they had been in late 2003. To place the housing bubble in historical perspective, we can follow the development of the Case-Shiller housing price index deflated by the GNP deflator (it would be essentially unchanged if deflated by the consumer price index) since 1891 (when price series began). Between 1996 and 2006 the cumulative real price increase was about 92 percent – more than three times the cumulative increase from 1890 to 1996 (Reinhart – Rogoff (2009): 207). There is no question that America witnessed its largest housing price boom on record prior to 2007, far larger than any other previous boom. Over the long period of 1890 to the second quarter of 2008, home prices (in real terms) rose yearly at a mere 0.57 percent on average, and even this is mainly due to the 6 percent average yearly growth between 1997 and 2007 (Barth et al (2009): 67 – 69).

Despite the continuous and sometimes rapid growth of house prices, the American bubble was not an extreme case among the advanced economies. Statistics from other developed countries show

12 The index family includes 23 headline indices – indices for 20 metropolitan statistical areas (MSAs) and three composite indices (National; 10-City and 20-City). Capturing approximately 75 % of US residential housing stock by value, the National Home Price Index is a quarterly index of single-family home prices for the nine US Census divisions. The 10 and 20 city composite indices also measure single family home prices and are calculated monthly. The methodology for calculating the indices is based on the research of Karl E. Case and Robert Shiller; it employs a repeat sales methodology, widely considered as the most accurate way to measure price changes for real estate. It measures the movement in the price of single-family homes by collecting data on actual sale prices in their specific regions. When a home is resold, months or years later, the new sale price is matched to its first sale price. These two data points are called a "sale pair". The difference in the sale pair is measured and recorded. All the sales pairs in a region are then aggregated into one index.

a similar or even higher appreciation of residential property prices. According to OECD data, during the decade between the last quarters of 1996 and 2006 the average annual increase in real house prices was slightly less than 5 % in the United States but exceeded this rate in several countries (for example the Netherlands, Australia, France, Sweden, Spain and the United Kingdom) and in Ireland it was over 10 % (De Michelis (2009): 17). Higher house price appreciation also lead to higher price decreases in some countries compared to the United States when the crisis "arrived".

Other evidence that home prices were over-valued in many countries was the diverging relationship between house prices and rents. Calculations by *The Economist* showed that house prices had hit record levels in relation to rents in America, Britain, Australia, New Zealand, France, Spain, the Netherlands, Ireland and Belgium, which suggests that homes were even more over-valued than at previous peaks (The Economist, June 16th 2005.) According to these calculations, America's ratio of prices to rents in 2005 was 35 % above its average level during 1975 – 2000; by the same gauge, property was "overvalued" by 50 % or more in Britain, Australia and Spain.[13]

In the past house price appreciation usually followed rising household income; real estate prices rose as a consequence of rising income or at least the positive expectations of higher income in the future. This time developments showed house prices deviating from fundamentals: "actual" wealth, income or the "real economy" (e.g. employment growth) were not growing as fast as property prices. For example during the years of sluggish growth in 2001 – 2003 (the "jobless recovery" after the burst of the dotcom bubble and the 9/11 terrorist attacks) house prices continued to grow at over 5 percent annually. The growth of house prices in America exceeded income growth and the price-to-income ratio rose continuously between 1998 and 2006. Again, the development was quite similar in most developed countries; in the majority of Western European states both the price-to-income ratio and the tempo of its growth was higher than in the United States (Table No. 1).

13 The average rent to price ratio between 1960 and 2008 was 5 percent in the US, but it declined below 4 percent after 2004 reaching a record low of just below 3.5 percent in the fourth quarter of 2006 (Barth et al (2009): 73).

Table 1: **House Price to Income Ratio in Selected OECD Countries** (long-term average = 100)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
United States	87.5	87.1	88.3	88.5	92.6	95.2	98.0	101.7	109.4	111.6	109.2
Japan	93.5	92.0	90.0	88.4	87.7	83.9	80.7	75.2	71.0	68.2	66.9
Germany	86.1	83.1	82.6	80.4	77.5	74.9	72.7	70.2	67.5	66.2	65.2
France	82.8	81.8	85.7	88.5	91.3	94.9	103.9	114.9	128.6	138.0	140.0
Italy	77.9	79.1	81.3	85.0	87.2	92.1	98.7	104.9	109.7	113.1	115.0
United Kingdom	77.2	82.5	88.5	96.8	98.7	111.0	122.5	134.7	134.8	137.7	149.7
Canada	99.9	95.3	95.1	92.8	93.7	100.4	106.7	111.6	118.6	124.4	131.3
Australia	91.5	96.4	98.8	101.6	106.9	126.0	143.3	143.1	137.6	139.5	144.9
Denmark	93.8	98.3	106.4	110.1	110.3	111.1	111.1	116.2	132.8	156.3	153.5
Spain	94.9	95.3	97.5	98.8	102.6	114.8	131.5	145.5	154.7	159.1	158.8
Ireland	83.3	98.4	114.0	120.5	116.1	129.0	142.8	147.7	157.8	168.8	155.0
Netherlands	99.6	105.3	118.5	133.0	134.9	141.3	147.3	151.4	154.7	160.1	158.5
Sweden	77.1	82.4	86.7	91.4	91.2	92.4	95.8	102.8	109.5	118.9	124.3
Switzerland	80.7	78.1	76.0	73.8	73.2	77.5	80.7	80.5	79.2	77.4	75.1

Source: **Organisation for Economic Co-Operation and Development (2008):** *OECD Economic Outlook*. Volume 2008/2. No. 84. OECD Publications, Paris, p. 310.

While the size of the American bubble was not much different from other Western countries' bubbles, its burst was quite exceptional. In 2007 the burst of the US housing bubble was the trigger of the financial and economic crisis, not the consequence of it. Historically, most housing crashes had occurred when economic conditions worsened (rising unemployment, falling income, tightened credit standards and rising interest rates):

"In the current U.S. housing downturn, mortgage arrears started rising before the economy turned down and before credit tightened... Even the arrears rate on prime mortgages increased by one quarter between its trough in early 2005 and mid-2007, despite a decline in unemployment over this period. By the end of 2007, arrears rates were much higher than in the previous recession. All this occurred well before credit standards were tightened. The tightening in credit, especially the reduced availability of subprime and Alt-A loans, was a response to increasing delinquencies and defaults, not the initial impetus to them. This was exactly the opposite of the sequence of events in other countries over the current cycle." (Ellis (2008): 9)

This exceptional development in the United States could be explained by the flexible construction sector, which in many regions created an excess supply, and by the substantial amount of risky and bad

mortgage loans outstanding. The construction boom led to an oversupply in housing in spite of relatively high population growth; this could be demonstrated by rising housing vacancy rates. While the population of the United States grew from 250 to 302 million (by 20.8 %) between 1990 and 2007, the total housing stock rose from 102.3 to 128.2 million units (by 25.3 %) and the vacancy rate increased from 11.3 to 13.8 percent (U.S. Census Bureau (2009): 7, 598; U.S. Department of Housing and Urban Development (2010): 86). The number of new privately owned housing units completed had risen from 1.4 million in 1997 to nearly 2 million in 2006 (but steeply declined to 1.12 million in 2008 and 794 thousand in 2009). Meanwhile, the average size of new homes also increased by approximately 10 % – in 2000 the median floor area of new houses measured 2057 square feet, in 2007 it had reached 2277 square feet (ibid. 593, 64).

The housing boom (and bust) did not occur uniformly across America. In some parts of this huge country (notably the very fast growing metro areas like Las Vegas and urban/suburban areas where zoning restrictions limited the supply of land, for instance the east coast cities and California) demand growth outstripped supply and house prices rose well above the national average (Baily et al (2008): 13, Ellis (2008): 17). The greatest excess price increases were concentrated in four "sand" states (California, Nevada, Arizona and Florida); after 2007 these same states experienced the largest fall in house prices exceeding the national average by great margins again (U.S. Department of HUD, Office... (2010): 14). All of them had very high population growth rates with the partial exception of California (where it was rather limited to certain counties like the "inland empire" around Los Angeles) but in the later building restrictions made an additional contribution to the high price growth. Table 2 and Map 1 demonstrate that the fastest rising metropolitan areas and counties were concentrated in the Sunbelt area (especially in the above mentioned sand states) while traditional large cities experienced only modest increases.

While huge economic expansion followed by a rise in population can explain much (but certainly not all) of the growth in property prices in many places, house prices were rising also in the most depressed rustbelt areas with sluggish economic, income and population growth or stagnation, such as in the Ohio Valley or Detroit. This is quite clear evidence of house price development seceding from the real economy:
"In the space of ten years (up to the end of 2005), house prices in Detroit – which probably possesses the worst housing stock of any American city other than New Orleans – had risen by nearly 50 percent;

not much compared with the nationwide bubble (which saw average house prices rise 180 percent), but still hard to explain given the city's chronically depressed economic state." (Ferguson (2008): 264)

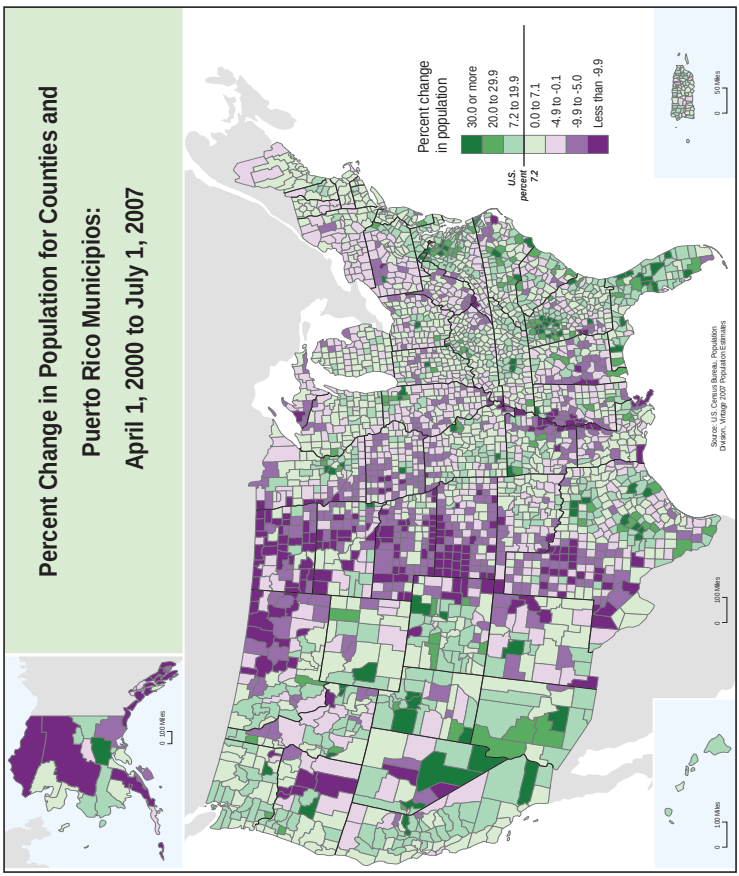
Table 2: **Selected Large US Metropolitan Statistical Areas with Highest Rates of Population Growth between 1990 and 2007**

Metropolitan statistical area	Number (1,000)			Percentage change	
	1990	2000	2007	1990 - 2000	2000 - 2007
Albuquerque, NM	599	730	835	21.7	14.5
Atlanta-Sandy Springs-Marietta, GA	3.069	4.248	5.279	38.4	24.3
Austin-Round Rock, TX	846	1.250	1.598	47.7	27.9
Bakersfield, CA	545	662	791	21.4	19.5
Boise City-Nampa, ID	320	465	588	45.4	26.4
Cape Coral-Fort Myers, FL	335	441	591	31.6	33.9
Charlotte-Gastonia-Concord, NC-SC	1.025	1.330	1.652	29.8	24.1
Chicago-Naperville-Joliet, IL-IN-WI	8.182	9.099	9.525	11.2	4.7
Colorado Springs, CO	409	537	609	31.3	13.3
Dallas-Fort Worth-Arlington, TX	3.989	5.162	6.145	29.4	19.1
Denver-Aurora, CO	1.667	2.179	2.465	30.7	13.1
Houston-Sugar Land-Baytown, TX	3.767	4.715	5.628	25.2	19.4
Jacksonville, FL	925	1.123	1.301	21.4	15.9
Las Vegas-Paradise, NV	741	1.376	1.836	85.6	33.5
Los Angeles-Long Beach-Santa Ana, CA	11.274	12.366	12.876	9.7	4.1
McAllen-Edinburg-Mission, TX	384	569	711	48.5	24.8
Miami-Fort Lauderdale-Pompano Beach, FL	4.056	5.008	5.413	23.5	8.1
Nashville-Davidson-Murfreesboro-Franklin, TN	1.048	1.312	1.521	25.1	16.0
New York-Northern New Jersey-Long Island, NY-NJ-PA	16.846	18.323	18.816	8.8	2.7
Orlando-Kissimmee, FL	1.225	1.645	2.032	34.3	23.6
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	5.436	5.687	5.828	4.6	2.5
Phoenix-Mesa-Scottsdale, AZ	2.238	3.252	4.179	45.3	28.5
Portland-Vancouver-Beaverton, OR-WA	1.524	1.928	2.175	26.5	12.8
Raleigh-Cary, NC	544	797	1.048	46.5	31.4
Riverside-San Bernardino-Ontario, CA	2.589	3.255	4.081	25.7	25.4
Sacramento—Arden-Arcade—Roseville, CA	1.481	1.797	2.091	21.3	16.4
Salt Lake City, UT	768	969	1.100	26.1	13.5
San Antonio, TX	1.408	1.712	1.991	21.6	16.3
Sarasota-Bradenton-Venice, FL	489	590	687	20.5	16.5
Tucson, AZ	667	844	967	26.5	14.6
Washington-Arlington-Alexandria, DC-VA--MD-WV	4,122	4,796	5,307	16.3	10.6

Note: The traditionally largest four MSAs (New York, Los Angeles, Chicago and Philadelphia) were added to make a comparison; otherwise they would not have made it into the group of fastest growing areas. Source: **U.S. Census Bureau (2009):** *Statistical Abstract of the United States: 2009*. Table 19. pp. 24 – 26.

At the national level the exceptional 2001 recession also signalized the secession of the housing sector from other parts of the economy. As Fed chairman Ben Bernanke pointed out, during the period of 1960 to 1999 in all but one recession declines in residential investment accounted for at least 40 % of the decline in overall real GDP (the sole exception was the 1970 recession, but this was preceded by a substantial decline in housing activity before the official start of the downturn). However, in sharp contrast to this during the 2001 recession residential investment *boosted* GDP growth (Bernanke (2007): 7). Behind all these anomalies – at national or regional level – one can find housing finance: expanding mortgage lending had been fueling the huge housing bubble.

Map 1: **Percent Change in Population in the USA** for Counties and Puerto Rico Municipios: 1 April 2000 to 1 July 2007



Chapter 2

The "culture of debt": rising indebtedness, expanding risky mortgage lending

„Mortgage brokers, who received premiums from the banks for each loan contract, actively chased down households that did not yet own a home. The mortgage standards were softened until neither records of income nor of net worth were necessary to receive a mortgage loan. In the end even low-wage and unemployed people, who had neither assets nor income to service the debt, were able to buy homes. The mortgages so acquired were called NINJA loans. No income, no job or assets – no problem... At the height of lending it was evidently no longer necessary to be still alive. Thus in the state of Ohio 23 mortgages were awarded to people already deceased."

Hans-Werner Sinn, 2010
(Sinn, Hans-Werner (2010): *Casino Capitalism. How the Financial Crisis Came About and What Needs to be Done Now.* Oxford University Press, Oxford, p. 105.)

The indebtedness of the American people had been rising fast previous to the crisis, most of this debt was made out of mortgage loans. The ratio of household debt to GDP, which in 1981 was 48 percent, had risen to 100 percent by 2007[14]; the household debt to disposable income ratio between 1981 and 2008 went from 65 to a staggering 135 percent (Roubini – Mihm (2010): 83). From 1959 until the eruption of the crisis in 2007 total mortgage debt outstanding in the United States had risen seventy-five fold (Ferguson (2008): 232). In 1949, mortgage debt was equal

14 The total US private sector debt (households + corporations + financial sector) increased from 123 percent of GDP to 290 percent between 1981 and the end of 2008: the corporate sector was much more prudent than the households, its debt increased from 53 to 76 percent of GDP. However, the debt to GDP ratio of the financial sector increased fivefold from 22 to 117 percent (Roubini – Mihm (2010): 83).

to 20 percent of total household income; by 1979, it had risen to 46 percent and by 2001 to 73 percent of income, (Green – Wachter (2005): 93). The residential mortgage debt outstanding had risen from 2.9 trillion USD in 1990 to 5.5 trillion USD in 2000 and had reached almost 12 trillion USD at the beginning of the crisis (FHFA (2010)). According to U.S. Census Bureau data (2010) based on the 2006 – 2008 American Community Survey from the 75.4 million owner-occupied housing units, an estimated 51.5 million had a mortgage and 23.9 million were paid off. According to the Fed Flow of Funds Accounts (2010) statistics, by the end of 2007 American households owed $13 671 billion, from this $10 498 billion was home mortgage debt; on the other hand, they held real estate assets valued at $20 892 billion, so their net worth (owners' equity in household real estate – in other words, households' real estate value minus mortgages) was an estimated $10 352 billion.[15] However, this was in the year when house prices had already entered a free fall and as properties are valued at actual market prices the value of real estate assets and consequently households' net worth dramatically decreased in the following years.[16] After an $8.2 trillion plunge in housing wealth from the end of 2005, mortgage debt entered 2010 at 163 percent of home equity – it had never been higher (Joint Center for Housing Studies of Harvard University (2010): 3).

Household mortgage debt relative to GDP had been rising rather slowly during the previous decades, it reached 40 % at the end of the eighties and 50 % at the turn of the millennium but to the end of 2007 it had jumped to about 75 % (Green – Wachter (2005): 94 and Federal Reserve Statistical Release (2010): 104). Despite this rapid expansion, the American residential mortgage debt to GDP ratio has not been extremely high in international comparison.

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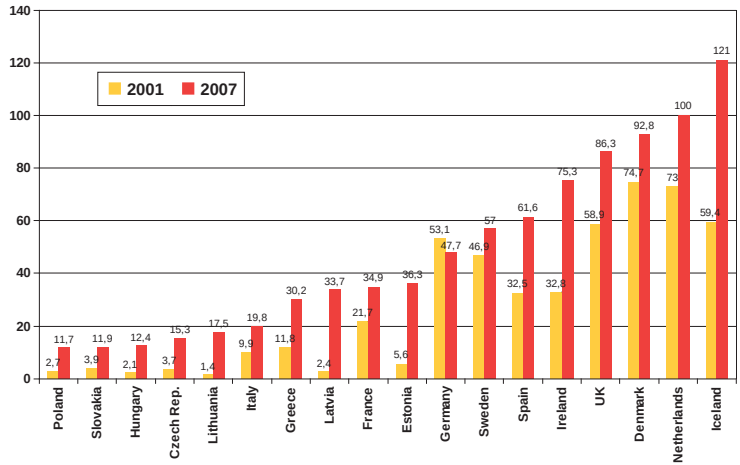
15 The total net worth of all American households (including nonprofit organizations) reached 64 242 billion USD as they held other assets than real estate, mostly of a financial nature (e.g. deposits, bonds, securities, equities, mutual fund shares, life insurance, pension fund reserves, etc.) but also consumer durable goods and others (Federal Reserve Statistical Release (2010): 104).

16 Between 2007 and second quarter of 2009 households' net worth shrank from $64 242 billion to $50 530 billion, the real estate value held by households went down from $20 892 billion to $16 677 billion and owners' equity in household real estate (households' real estate value minus mortgages) decreased from $10 352 billion to $6 213 billion (Federal Reserve Statistical Release (2010): 104).

Figure 2: **Residential Mortgage Debt to GDP Ratio in Selected European Countries** (2001 and 2007 in %)



Notes: The corresponding figure for the United States stood at around 75 % of GDP in 2007 when measured as households' home mortgage debt relative to GDP or 85 % when measured as total residential mortgage debt outstanding (total mortgage debt minus commercial mortgages) relative to GDP. In the case of Slovakia, 2002 instead of 2001.

Source: **European Mortgage Federation (2008):** *Hypostat 2007. A Review of Europe's Mortgage and Housing Markets.* p. 57 and **Federal Reserve Statistical Release (2010):** *Flow of Funds Accounts of the United States. Flows and Outstandings, Second Quarter 2010*, pp.13, 95 – 96 for U.S. data in the note.

It is quite clear from the data presented above that the housing bubble or the indebtedness of the American people was not very different from the figures of other developed countries. Quite a few nations experienced similar or even higher property prices, debt to income or mortgage debt to GDP ratios as well as higher increases in prices and debt ratios. While the weight and the tempo of the rise of the US mortgage-fuelled housing bubble was not that exceptional, there were some substantial differences vis-à-vis other major developed economies:

- The quality of mortgages originated after 2000 had declined significantly in America and the share of nonconforming loans, including risky subprime and Alt-A mortgages was rising until 2007. These loans had very high delinquency and foreclosure rates just a few years after their origination.
- Americans had far more possibilities to choose from a wide variety of mortgage constructions available than in any other country. The crucial differences were in the possibilities of refi-

nancing and non-recourse default on mortgage debt. The penalty-free prepayments allowed US households to easily refinance their existing mortgage loans when better market conditions occurred and the (de jure or de facto) ability of non-recourse default on debt made it easier to "walk away" from the property when market conditions worsened and people found themselves with negative equity. These factors lead to decreasing prudence on the side of borrowers.

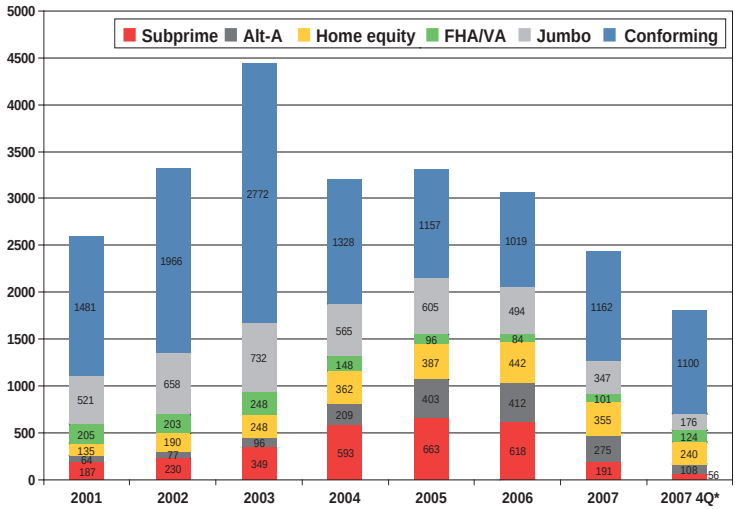
- By the eruption of the crisis the majority of outstanding residential mortgages and the overwhelming majority of new mortgages issued had been securitized (transformed into mortgage-backed securities and sold to investors in financial markets). The United States has by far the highest securitization rates in the world. As mortgages are packed and sold to investors, the risk of default is also transferred to them; this way the risk awareness of primary mortgage lenders or "sellers" (brokers, banks and thrifts) also decreased.
- In no other developed country was the government – by various means, directly and indirectly – so involved in the mortgage market (as it turned out usually deepening the problems rather than preventing them) as in the United States.

2.1 Deteriorating quality of mortgage loans

The first of the major differences between America and other developed countries (which are discussed here and below in detail) was the deteriorating quality of mortgage loans. As Figure 3 shows, mortgage lending thanks to favorable conditions (historically low interest rates) expanded from 2001 and the mortgage-fuelled housing boom boosted the economy during its recovery from the 2001 recession. Mortgage origination almost doubled by 2003 but around 85 percent of the new loans were still considered to be prime (conforming loans, FHA and VA loans and jumbo loans – see the glossary in the annex). Conforming loans were given to borrowers who qualified for a certain seal of approval set by the two GSEs: Fannie Mae and Freddie Mac (a loan limit, LTV ratio and credit scores) and had implicit government backing as they were typically purchased and securitized by the GSEs. FHA and VA loans as well as farm mortgages had explicit government backing as they were insured by federal agencies and securitized by

the Ginnie Mae. Jumbo loans were too large (in value) to qualify for GSE standards but were given to borrowers who otherwise would be considered to be prime. The total volume of mortgage origination dropped after 2003 but the share of Alt-A, subprime and home equity lending expanded greatly. Alt-A and subprime loans were too risky to qualify for GSE standards because they were given to borrowers with a bad credit history or no credit history at all (new immigrants for example) and/or with non-existing or low documentation of income and assets. Home equity lines (HEL) were usually second mortgages used to cash out (part of) the remaining equity in the home, mostly used to pay back other loans or for consumption. In 2006 almost half (48 %) of new mortgages issued were subprime, Alt-A or HEL. Loans to subprime borrowers reached about 13 % of outstanding mortgages in 2006 (Bernanke (2007): 6).

Figure 3: **Residential Mortgage Originations by Product in the USA** (2001 – 2007, billions of 2007 US dollars)



Note: * Data for 4th quarter 2007 are annualized.

Source: **Joint Center for Housing Studies of Harvard University (2008):** *The State of the Nation's Housing: 2008.* Cambridge, MA, p. 39 based on Inside Mortgage Finance data.

The figures on mortgage issuance could be a bit misleading as a high share of new loans is often used to refinance old ones rather than for home purchases. However, at least until 2007 the huge volume of mortgage origination ensured a steady rise in

outstanding mortgage debt, of which riskier subprime, Alt-A and HEL loans made up a continuously expanding part. American consumers enjoyed the greatest variety of mortgage loans and probably the most borrower-friendly conditions in the world:

"The US mortgage provides many more options to borrowers than are commonly provided elsewhere: American homebuyers can choose whether to pay a fixed or floating rate of interest; they can lock in their interest rate in between the time they apply for the mortgage and the time they purchase their house; they can choose the time at which the mortgage rate resets; they can choose the term and the amortization period; they can prepay freely; and they can generally borrow against home equity freely. They can also obtain home mortgages at attractive terms with very low down payments." (Green – Wachter (2005): 93 – 94)

After 2003 American consumers increasingly exploited the availability of various nontraditional mortgage products, often with very favorable initial "teaser" interest rates including interest-only and negative amortization loans.[17] (Subprime "teaser rates" were low only in comparison with other subprime interest rates or with the interest paid after hybrid loans resetting at the end of the initial few years' period; they were not low in comparison with prime mortgage rates.) As Bhardwaj and Sengupta (2009) noted, subprime borrowing and lending was strongly related to refinancing. The great majority of subprime loans were taken to refinance older mortgages (and cash out part of the remaining equity) and borrowers wanted to exit from them (when they reset to higher interest rates) by either refinancing them again or selling their property. However, this option is available only when house prices continue to appreciate – an assumption almost everyone shared, including lenders. When house prices started to fall from 2006, delinquencies and foreclosures rose sharply, triggering the crisis. In other words, many nonprime borrowers could afford their mortgage only if house prices continued to rise, allowing them to refinance the loan when its teaser rates ended. The massive problems with subprime loans were

17 The share of interest-only and negative amortization loans within total mortgage origination used to purchase a home (excluding refinancing loans) was the following: 1 % (2001), 4 % (2002), 6 % (2003), 25 % (2004), 29 % (2005) and 23 % (2006) (Baily et al (2008): 18).

masked by rising housing prices but were revealed when property prices started to fall (Demyanyuk – Hemert (2008)).

Subprime loans were heavily concentrated in certain urban areas, where home ownership had not previously been common (Detroit, Miami, Riverside, Orlando, Las Vegas and Phoenix) as well as the economically depressed areas of Ohio, Michigan and Indiana, where borrowers facing financial difficulties switched to subprime mortgages (Mizen (2008): 536). Using detailed zip code level data, Mian and Sufi (2008) demonstrated that subprime neighborhoods – existing all over the United States almost in every metropolitan area – experienced a historic increase in mortgage credit from 2002 to 2005, experiencing credit growth more than twice as high as the growth in prime zip code areas (after 2006, they had an increase in default rates that was more than three times as high as prime zip codes in the same metropolitan area).[18] Mian and Sufi also showed that the expansion in mortgage credit from 2002 to 2005 to subprime zip codes occurred despite sharply declining relative (and in some cases absolute) income growth in these neighborhoods, finding 2002 to 2005 the only period in the previous eighteen years when income and mortgage credit growth were negatively correlated.

18 Prime and subprime zip codes were determined by splitting zip codes into four quartiles based on the fraction of subprime borrowers (a credit score less than 660) as of 1996. Prime zip codes were the lowest quartile and subprime zip codes were the highest quartile (Mian – Sufi (2008): 1).

Table 3: **US Subprime Loan Characteristics at Origination for Different Vintages**

	2001	2002	2003	2004	2005	2006	2007
Number of Loans (1000)	452	737	1258	1911	2274	1772	316
Average Loan Size ($ 1000)	126	145	164	180	200	212	220
Mortgage Type							
FRM (%)	33.2	29.0	33.6	23.8	18.6	19.9	27.5
ARM (%)	0.4	0.4	0.3	0.3	0.4	0.4	0.2
Hybrid (%) 1	59.9	68.2	65.3	75.8	76.8	54.5	43.8
Balloon (%) 2	6.5	2.5	0.8	0.2	4.2	25.2	28.5
Loan Purpose							
Purchase (%)	29.7	29.3	30.1	35.8	41.3	42.4	29.6
Refinancing (cash out) (%)	58.4	57.4	57.7	56.5	52.4	51.4	59.0
Refinancing (no cash out) (%)	11.2	12.9	11.8	7.7	6.3	6.2	11.4
Other characteristics							
FICO Score 3	601.2	608.9	618.1	618.3	620.9	618.1	613.2
Combined Loan-to-Value Ratio (%)	79.4	80.1	82.0	83.6	84.9	85.9	82.8
Debt-to-Income Ratio (%) 4	38.0	38.5	38.9	39.4	40.2	41.1	41.4
Documentation (%) 5	76.5	70.4	67.8	66.4	63.4	62.3	66.7
Prepayment Penalty (%) 6	75.9	75.3	74.0	73.1	72.5	71.0	70.2
Mortgage Rate (%)	9.7	8.7	7.7	7.3	7.5	8.4	8.6
Margin for ARM and Hybrid Mortgage Loans (%) 7	6.4	6.6	6.3	6.1	5.9	6.1	6.0

Notes: 1. A hybrid mortgage carries a fixed rate for an initial period (typically 2 or 3 years) and then the rate resets to a reference rate (often the 6-month LIBOR) plus a margin. 2. A balloon mortgage does not fully amortize over the term of the loan and therefore requires a large final (balloon) payment. 3. A numerical industry-wide used rating of the credit history of individuals, developed by the Fair Isaac Corporation. 4. Debt payments as % of income – only if provided (for around third of the loans in the database not provided). 5. Share of loans with full documentation. 6. Share of loans with prepayment penalty. 7. The difference between ARM and Hybrid mortgage interest rates and the reference rate (often the 6-month LIBOR).

Source: **Demyanyuk – Hemert (2008):** *Understanding the Subprime Mortgage Crisis*. Federal Reserve Bank of St. Louis, based on the First American CoreLogic LoanPerformance database as of June 2008, which includes loan-level data on about 85 percent of all securitized subprime mortgages (more than half of the US subprime mortgage market).

In summary, the boom in mortgage borrowing which fueled the housing bubble was sustained by low interest rates (prime mortgages around 2003) and by deteriorating lending practices (the rising share of subprime and other risky loans after 2003). Table 3 provides further illustration of this, showing that subprime mortgages were risky from the beginning, being given to borrowers with low FICO (credit) scores, having high loan-to-value and debt-to-income ratios, limited documentation and usually being used for cash-out refinancing. The only worse condition (from the viewpoint of mortgagors) compared to prime loans was the higher in-

terest rate and many times also the prepayment penalty. By taking mostly hybrid loans, borrowers hoped to bypass them by planning to refinance mortgages when they reset from low initial teaser rates to higher ones before occurring a prepayment penalty. The whole model could be sustained only while house prices continued to rise. In addition, speculation with houses was on the rise, an increasing number of properties were bought for investment, and actually almost everybody thought it was a good investment:

"A study by the National Association of Realtors (NAR) found that 23 % of all American houses bought in 2004 were for investment, not owner-occupation. Another 13 % were bought as second homes. Investors are prepared to buy houses they will rent out at a loss, just because they think prices will keep rising—the very definition of a financial bubble. "Flippers" buy and sell new properties even before they are built in the hope of a large gain. In Miami, as many as half of the original buyers resell new apartments in this way. Many properties change hands two or three times before somebody finally moves in. New, riskier forms of mortgage finance also allow buyers to borrow more. According to the NAR, 42 % of all first-time buyers and 25 % of all buyers made no downpayment on their home purchase last year. Indeed, homebuyers can get 105 % loans to cover buying costs. And, increasingly, little or no documentation of a borrower's assets, employment and income is required for a loan." (The Economist, June 16th 2005.)

Subprime loans were given to borrowers, most of whom would probably have been rebuffed when applying for a mortgage outside the United States. Loans similar to American subprime or Alt-A were rare or non-existent in other developed countries. The only other country with a significant share of these loans was the United Kingdom (a peak of eight percent of mortgages in 2006), non-prime accounted for five percent of mortgages in Canada and less than two percent in Australia (Lea (2010): 29 – 30).

2.2 Homes as ATMs – frequent refinancing, easy walk away

While most of the problems (risky loans) were certainly concentrated in the non-conforming parts of the American mortgage business, some of the features were common for the whole sector. Continuous cash-out refinancing relying on past and expected house price appreciation was a widespread phenomenon. Traditionally conforming FRM loans were prepayment penalty free in the United States: penalties were not allowed in a number of states, and even in the states that did allow them, Fannie Mae and Freddie Mac did not historically enforce such penalties (Lea (2010): 23). Greenspan and Kennedy (2007) have estimated that during the 1991 – 2005 period people withdrew around 8 trillion dollars, or on average $530 billion annually, from the equity in their homes.[19] From 2001 to 2005 equity extraction financed close to 3 % of personal consumption expenditures (ibid. p. 10). From 2007 cash-out refinancing together with house prices entered a free fall. The annual volume of home equity cashed out by refinancing prime, first-lien conventional mortgages declined to $70.8 billion in 2009 – about one-fifth of the 2006 peak level and below 2001 levels in nominal terms[20] (Joint

19 Authors estimated three types of equity extraction: (1) extraction resulting from existing home sales (equal to first lien mortgages used to purchase existing homes minus the associated debt cancellation of sellers – about two thirds of extracted cash), (2) cash outs of home equity resulting from the refinancing of first liens (20 percent of cash) and (3) the change in home equity loans net of unscheduled payments on first liens (around 13 percent of the total). Households used this cash for various purposes like consumer spending, outlays for home improvements, debt repayment, acquisition of assets and others (Greenspan – Kennedy (2007): 6 – 9).

20 The $70.8 billion sum refers only to the equity extraction by cash out refinancing reported by Freddie Mac (which includes only prime first lien conventional mortgages), therefore it is not comparable with the Greenspan – Kennedy estimates. However, considering the huge fall of house prices as well as existing home sales (dramatically reducing the ability of households to extract cash from home sales) and the evaporation of nonconventional mortgage lending (including home equity loans), it probably represents the vast majority of equity extraction in 2009.

Center for Housing Studies of Harvard University (2010): 10). Meanwhile, the share of cash-in refinances (borrowers paying down debt when they refinanced) climbed from about 10 percent in 2006 to 36 percent by the fourth quarter of 2009 (ibid.). As Table 4 illustrates the possibility of refinancing (early repayment of mortgages without penalty in most cases) is a quite unique opportunity for American households. It reduced the prudence on the borrowers' side; many of them took loans they could not afford on long term without house price appreciation or further property refinancing or selling.

Table 4: **Mortgage Terms across Different Countries** (around 2002 – 2005)

	Typical LTV	Maximum LTV	2nd mortgage	Mortgage debt to GDP	Fixed-term range 10 – 20 years	Fixed-term range 20+years	Repayment by fee-free redemption
United States	75 %	97 %	A	69 %	A	A	A
Denmark	80 %	80 %	A	70 %	A	A	A
France	67 %	100 %	L	25 %	A	L	N
Germany	67 %	80 %	A	53 %	A	L	N
Italy	55 %	80 %	A	13 %	L	L	N
Netherlands	90 %	115 %	A	100 %	A	L	N
Portugal	83 %	90 %	A	51 %	N	N	N
Spain	70 %	100 %	A	42 %	L	L	N
UK	69 %	110 %	A	69 %	L	N	L
Japan	80 %	80 %		36 %	A	A	L
Korea	40 %	75 %	N	14 %	L	N	A
Canada	65 %	90 %	A	44 %	N	N	N
Australia	63 %	80 %	A	74 %	N	N	L

Notes: Key: **A** = available; **L** = limited availability; **N** = no availability.

Source: **Green – Wachter (2005):** *The American Mortgage in Historical and International Context.* Journal of Economic Perspectives, Volume 19, Number 4, p. 101.

Probably the largest difference between much of the United States and other advanced economies was the possibility of non-recourse default on mortgage debt without risking a deficiency judgment. This means that if the borrower defaults, the lender gets the home as collateral but cannot pursue the borrower for any deficiency between the home's value and the remaining debt. In other words, borrowers with negative equity (LTV over 100 %) can default on their debt without the risk that they have to pay back the difference between the fair market (selling) price of the property and the mortgage loan. The loss from a foreclosure goes to the lender, not the borrower; the latter does not have a personal liability for the debt. In any other country with de-

veloped housing finance, mortgage loans are (full) recourse, defaulters face deficiency judgments, lenders can seek not just the collateral (house) but borrowers' other assets or future income to compensate for the losses from default. Borrowers remained liable for deficiencies in Belgium, Germany, Greece, the Netherlands, Spain, France, Ireland, Portugal and the United Kingdom; loans were recourse outside Europe (in Australia, Canada, Japan and South Korea) as well (Lea (2010): 32).

In fact, the situation is a bit more complicated in the United States. Ghent and Kudlyak (2009) classified 11 states of the Union – Alaska, Arizona, California, Iowa, Minnesota, Montana, North Carolina (purchase mortgages), North Dakota, Oregon, Washington and Wisconsin – as non-recourse, where deficiency judgments are explicitly forbidden or so highly limited and impractical that it makes the state de facto non-recourse. Although the remaining US states (actually the majority) were de jure recourse allowing deficiency judgments, in reality there were still many obstacles that made seeking deficiency costly and time-consuming.[21] This lead to a situation where many lenders rather opted for retrieving the collateral alone in a quicker and cheaper non-judicial foreclosure procedure (if available), than to incur the legal costs of pursuing defaulting borrowers for any deficiency (Ellis (2008): 20). The research by Ghent and Kudlyak (2009) has shown that recourse decreases the probability of default in the United States and the magnitude of this deterrence is higher in the case of wealthier borrowers. An international comparison gives further reassurance for this deterrence effect. Despite the fact that many developed countries experienced a similar build-up in housing debt and even greater house price volatility as well as

21 The deficiency judgments are limited in several ways even in states characterized as recourse. Foreclosure laws in about half of the US states require judicial foreclosure procedures, meaning higher legal costs. The lender usually must accept the fair market value of the property (determined by an appraiser or jury) rather than the foreclosure sale price. In some states (notably Florida and Texas), substantial personal property or wages are exempt from the collection of deficiency; in some others, the lender has a relatively short period in which to collect on the deficiency after the foreclosure sale. Finally, even after the 2005 bankruptcy reform, borrowers below the state median income can declare bankruptcy under Chapter 7, in this case deficiency judgments are completely discharged and the lender loses the right for deficiency. (Ghent – Kudlyak (2009): 4 – 5, 32).

the fact that some had relatively high delinquency rates (for example UK non-conforming loans), default rates *everywhere* remained far below that of the United States (Lea (2010): 30). One cannot overlook the connection with the deterrent effect of recourse in all other countries. The character of the US housing meltdown also suggests that this time negative equity played a dominant role in rising defaults, at least at the beginning of the crisis. Delinquency rates and foreclosure starts reached internationally unprecedented levels by the end of 2007, before the economy started to shrink and before unemployment rose or personal income dramatically fell. There are two major motivations for delinquency and default emphasized in the literature (Ellis (2008): 11):

- The *ability-to-pay model* emphasizes the affordability of the repayment and individual income-related factors such as income and employment. Households default on their mortgages because they lose their jobs, get divorced, or incur large medical bills. Rising interest rates (and thus required mortgage repayments) could add to the effect.
- The *equity model* of default treats the choice to default as a possible option. It depicts borrowers as defaulting rationally when they are in negative equity.

While the first model could explain many of the defaults in economically depressed "rust-belt" states (Ohio, Indiana and Michigan) prior to the crisis, the second is probably the dominant factor behind the rising wave of foreclosures from 2006. There is some anecdotic evidence that many of the households who found themselves in negative equity made a minimal effort to avoid defaulting:

"In a significant percentage of defaults in the current crisis, borrowers are simply mailing in the keys to the house and are not even contacting the lender to try and work out a settlement that would avoid default... On the other hand, lenders rarely find it profitable to pursue defaulting borrowing – big bank suing poor family in trouble is not a situation most banks want to take to a court." (Baily et al (2008): 20)

Negative equity became unusually widespread after 2006; its proportion peaked in late 2009. According to First American CoreLogic data more than 11.3 million or 24 percent of all residential properties with mortgages in the United States were in negative equity at the end of the fourth quarter of 2009, making an aggregate dollar value of negative equity estimated at $801 billion or an

average value for an "underwater" borrower of $ 70 700 (CoreLogic (2010): 1).[22] Additionally, 2.3 million mortgages were approaching negative equity at the end of 2009 (meaning they had less than five percent equity); together, negative equity and near-negative equity mortgages accounted for nearly 29 percent of all residential properties with a mortgage nationwide.[23] CoreLogic data also shows that the rise in negative equity is closely tied to increases in pre-foreclosure activity: higher the negative equity, the more likely households were to enter foreclosure (ibid.).

Normally borrowers and lenders would be partners in avoiding foreclosure. Borrowers would try to keep their homes, their credit rating and most importantly avoid deficiency judgments. In practice, lenders traditionally always tried to avoid foreclosure for several reasons: properties depreciate substantially when the borrower is in default, the property usually sells at a distressed value in a foreclosure sale, and lenders have negative publicity and a bad reputation among other prospective borrowers if they forcibly remove a borrower from their house (Ghent and Kudlyak (2009): 6). Seeing foreclosure as a solution of last resort is especially strong among lenders when house prices are falling. This was exactly the case during the last crisis; however, it seems that many borrowers were not cooperating very much this time. House price declines (later combined with a worsening economic situation) triggered an internationally but also historically (at least since the Great Depression) unprecedented wave of delinquencies and foreclosures. The analysis of the European Central Bank offers a good conclusion:

22 First American CoreLogic's data includes 47 million properties with a mortgage, which accounts for over 85 percent of all mortgages in the United States.

23 Negative equity was concentrated in five states: Nevada (which had the highest percentage negative equity with 70 percent of all of its mortgaged properties underwater), followed by Arizona (51 percent), Florida (48 percent), Michigan (39 percent) and California (35 percent). Among the top five states, the average negative equity share was 42 percent, compared to 15 percent for the remaining 45 states. In numerical terms, California (2.4 million) and Florida (2.2 million) had the largest number of negative equity mortgages accounting for 4.6 million, or 41 percent, of all negative equity loans. (CoreLogic (2010): 1).

"Borrowers in euro area countries do not generally have major incentives to default on a mortgage, since they remain personally liable for any difference between the value of the property and the amount of the loan. While deficiency judgments are available in principle, the system in the majority of US states tends, in practice, to work as if loans are non-recourse debt. Indeed, as judicial foreclosures tend to be costly in comparison with the recoupable value, lenders obtain repossession via a non-judicial foreclosure process in the majority of cases. Due to this widespread practice, distressed borrowers find it convenient to simply walk away from the mortgage, thus magnifying the effect of negative equity following house price depreciation. Overall, the relative ease of personal bankruptcy, together with the shorter duration of repossession procedures, in the United States is probably contributing to the current sharp increase in mortgage foreclosures and defaults" (ECB (2009): 73).

2.3 The foreclosure tsunami

Regionally the "sand states" experienced the highest rise in foreclosures: The average foreclosure start rate in 2008 among this group was 1.76 percent – more than twice the national average (see table No. 5). The foreclosure starts before the end of 2006 were among the lowest in these states but after that skyrocketed to the highest levels (U.S. Department of HUD – Office... (2010): 12 – 13). These states had the highest house price appreciation before the crisis, so borrowers could easily refinance (this explains the low foreclosure start rate till mid-2006). However, they also had an above average share of high-cost loans, which indicates the prevalence of risky non-conforming loans. As sand states also experienced the highest drop in house prices, most borrowers could not refinance anymore, many faced negative equity and often interest rates (of hybrid mortgages) resetting to higher levels. The following dramatic rise in delinquencies and foreclosures is not a surprise. Worsening economic conditions (like rising unemployment) just deepened these problems. On the other hand, the depressed rust-belt areas already had the highest delinquency and foreclosure rates well before the crisis, which just further deteriorated these conditions. However, the decline in property prices was modest (at least com-

pared to the sand states) and thus negative equity and related (rational or strategic) foreclosures were less frequent.

Table 5: **State-Level Trends in Foreclosures Starts and Selected Market Factors**

State	Foreclosure start rate			High-cost loan share	Annual change in FHFA house price index		Unemployment rate	
			Change					
	2005	2008	2005 – 2008	2006	2005	2008	2005	2008
"Sand states"								
Nevada	0.20	2.34	2.14	34.6 %	22.2 %	- 23.0 %	4.50	6.70
Florida	0.23	2.19	1.96	37.0 %	24.6 %	- 20.1 %	3.80	6.20
Arizona	0.22	1.73	1.51	32.5 %	28.8 %	- 16.2 %	4.60	5.50
California	0.15	1.58	1.43	30.5 %	21.2 %	- 24.3 %	5.40	7.20
"Rust-belt"								
Michigan	0.63	1.25	0.61	32.4 %	1.9 %	- 10.4 %	6.80	8.40
Indiana	0.92	1.16	0.24	30.4 %	3.2 %	- 2.4 %	5.40	5.90
Ohio	0.84	1.15	0.31	29.1 %	2.9 %	- 4.5 %	5.90	6.50
Illinois	0.47	1.05	0.58	32.1 %	7.1 %	- 3.9 %	5.80	6.50
U.S. average	0.39	0.82	0.43	27.2 %	10.3 %	- 3.9 %	4.91	5.30

Note: FHFA = Federal Housing Finance Agency. High-cost loans are originated with an annual percentage rate at or above 3 percentage points plus the applicable Treasury yield.

Source: **U.S. Department of Housing and Urban Development – Office for Policy Development and Research (2010):** *Report to the Congress on the Root Causes of the Foreclosure Crisis.* Washington, D.C., pp. 67 - 68.

According to RealtyTrac data, foreclosure activity reached record heights in 2009: A total of 3,957,643 foreclosure filings (default notices, scheduled foreclosure auctions and bank repossessions) were reported on 2,824,674 US properties in 2009 (a 21 percent increase in total properties from 2008 and a 120 percent increase from 2007), meaning that 2.21 percent of all US housing units (one in 45) received at least one foreclosure filing during the year, up from 1.84 percent in 2008, 1.03 percent in 2007 and

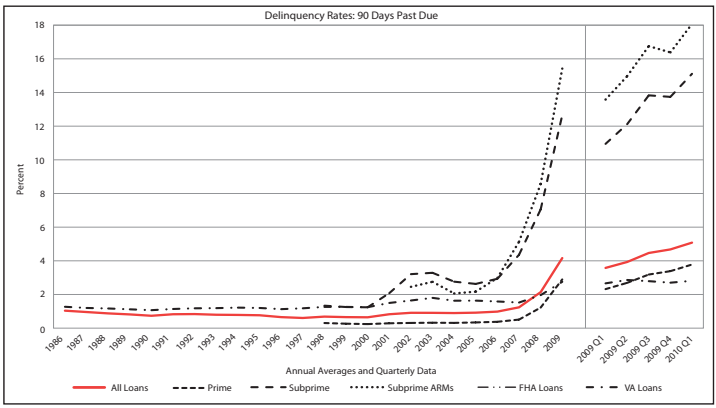
0.58 percent in 2006 (RealtyTrac (2010)).[24] The regional distribution of foreclosures continued to strongly resemble the distribution of negative equity. In 2009 more than 10 percent of Nevada housing units received at least one foreclosure filing, giving it the nation's highest state foreclosure rate for the third consecutive year, followed by Arizona (6.12 %), Florida (5.93 %), California (4.75 %) and Utah (2.93 %). While bank repossessions and foreclosure auctions continued to hit record high levels until the third quarter of 2010, default notices in the same time declined 21 percent on a year on year basis from their peak in the third quarter of 2009 – this predicts a following decline of auctions and repossessions and signals the turning point of foreclosure activity (ibid).

To the end of 2008 (in absolute numbers) the non-prime segment of the mortgage market accounted for most foreclosures and the share of seriously delinquent loans within this category reached extremely high, internationally unprecedented levels. As Figure 4 illustrates, subprime loans already had high delinquency rates around the 2001 recession but at that time their market share was still marginal. Later – as we explained above – the combination of continuous house price appreciation and widespread refinancing masked the looming problems in this sector. After 2006 with declining residential property prices the refinancing option was drastically limited, the problems were revealed and delinquencies of non-prime loans skyrocketed. The following recession just made things worse; there was no sign of relevant improvement until mid-2010. The subprime housing meltdown certainly worked as a trigger of the financial crisis, which is why it was quite often called the "subprime crisis" or "subprime panic", at least initially.

24 The RealtyTrac U.S. Foreclosure Market Report provides a count of the total number of properties with at least one foreclosure filing entered into the RealtyTrac database during the year. Some foreclosure filings entered into the database during the year may have been recorded in previous years. Data is collected from more than 2,200 counties nationwide, and those counties account for more than 90 percent of the US population. RealtyTrac's report incorporates documents filed in all three phases of foreclosure: Default, Notice of Default (NOD) and Lis Penders (LIS), Auction – Notice of Trustee Sale and Notice of Foreclosure Sale (NTS and NFS), and Real Estate Owned or REO properties that have been foreclosed on and repurchased by a bank. If more than one foreclosure document is received for a property during the year, only the most recent filing is counted in the report.

But following developments showed that it was just the tip of the iceberg and problems were present across the whole mortgage financing industry. FHA loans (explicitly guaranteed and financed by the federal government) had continuously high delinquency rates from the turn of the millennium and from 2009 the number of prime loans entering foreclosures outpaced the subprime and Alt-A ones.

Figure 4: **Delinquency Rates: 90 Days Past Due** (US residential mortgages by type)

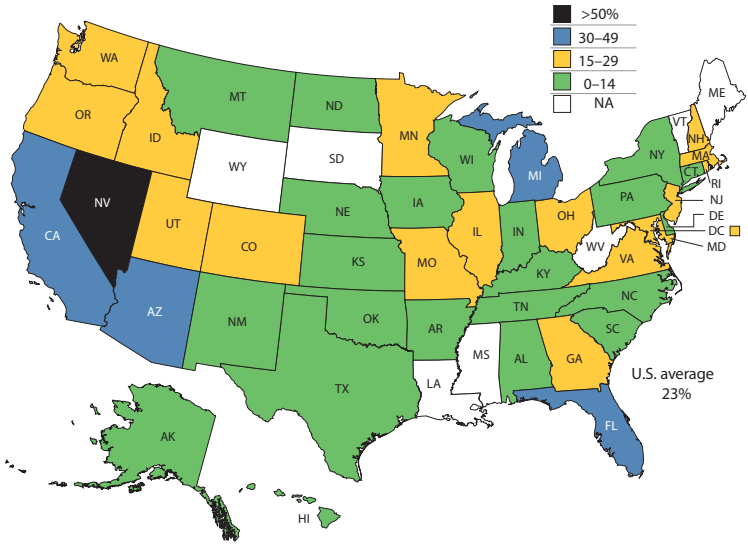


Source: **U.S. Department of Housing and Urban Development (2010):** *U.S. Housing Market Conditions. 2nd Quarter 2010*, p. 79 based on Mortgage Bankers Association's National Delinquency Survey data.

Since 2009 there have been more foreclosure procedures (in absolute numbers) related to prime mortgages – previously considered the safest with low credit risk [OCC – OTS (2009 – 2010)].[25]

25 The *OCC and OTS Mortgage Metrics Reports* present data on first-lien residential mortgages serviced by national banks and thrifts, focusing on credit performance, loss mitigation efforts and foreclosures. The OCC and OTS collect these data from the nine national banks and two thrifts with the largest mortgage-servicing portfolios among national banks and thrifts. The data represent more than 64 percent of all first-lien residential mortgages outstanding in the country. More than 90 percent of the mortgages in the portfolio were serviced for third parties because of loan sales and securitization. At the end of March 2010, the reporting institutions serviced almost 34 million first-lien mortgage loans, totaling nearly $6 trillion in outstanding balances. (OCC – OTS (2009 – 2010): *OCC and OTS Mortgage Metrics Report. Disclosure of National Bank and Federal Thrift Mortgage Loan Data*.)

Map 2: **Share of Mortgage Loans with Negative Equity** (%, third quarter 2010)



Source: **FCIC – Financial Crisis Inquiry Commission (2011):** *The Financial Crisis Inquiry Report.* U.S. Government Printing Office, Washington D.C., p. 404. Based on CoreLogic data.

Comparisons with European countries show that delinquency and especially foreclosure rates in Europe were not only far below the American non-prime rates but also below the prime ones. As Figure 4 illustrates, the average serious delinquency rate in 2009 exceeded 4 percent in the United States. In the EU member states – including the ones which experienced higher house price volatility and a larger rise in residential mortgage debt compared to the United States, like Ireland, Spain and the United Kingdom – delinquencies remained below the American levels.[26] In Ireland the share of mortgages in arrears by three months or more reached 3.32 percent in September 2009; in Spain doubtful loans reached 3 percent of total mortgages outstanding in the third quarter of 2009 and in the United Kingdom the share of mortgage arrears

26 The comparison is quite complicated because – unlike in the US – there is no agreed common definition at the EU level for mortgage delinquencies; indicators of Non-Performing Loans (NPLs) – arrears, doubtful loans and repossessions – largely differ in definitions across the individual member states (EMF (2010): 7).

over three months was 2.44 percent at the end of June 2009 (EMF (2010): 19, 23, 29) The difference is much more striking when comparing foreclosure data, which are counted in the thousands or tens of thousands in EU countries and not in the hundreds of thousands like in the US states (with similar populations). For example, there were 24.1 thousand repossessed properties in the United Kingdom in the first half of 2009, 47.1 thousand in Spain and less than a hundred in Ireland (ibid. 19, 24, 30). These differences occurred in spite of the fact that American and European borrowers faced a similar economic environment: historic low interest rates, lender and government programs aimed at keeping borrowers in their homes (i.e. home retention actions) and often difficult personal economic situations because of falling property prices, lower real income and rising unemployment.

The previous pages offered possible explanations for the decreasing prudence of American borrowers and concentrated on the question of why many of them took mortgages which – as it later turned out – they could not afford (i.e. they were not able to pay them back). But we still have not explained the reasons why the lenders offered these loans and their sources of funding. A mortgage loan always has two contracting sides: a borrower and a lender who is risking their money. It is hard to imagine why so many lenders (often big, well-organized institutions with an extensive analytical capacity) offered so much money considering the nature of American housing finance (especially the non-recourse character of mortgages and the questionable creditworthiness of many borrowers). It is also not clear how the housing meltdown threatened to tear down the whole American (and global) financial system. Normally it would threaten "just" financial institutions heavily involved in American housing finance (i.e. mortgage lenders). The following subchapters will try to explain the funding of the housing boom with its many interconnected actors and their motivations as well as the nature of the new financial system that evolved after decades of financial innovation.

Chapter 3

Financial innovation: securitization funding the credit and housing boom

"As securitization became increasingly commonplace in the 1990s and 2000s, mortgage brokers, mortgage appraisers, ordinary banks, investment banks, and even quasi-public institutions like Fannie Mae and Freddie Mac no longer subjected would-be borrowers to careful scrutiny. So-called liar loans became increasingly common, as borrowers fibbed about their income and failed to provide written confirmation of their salary. Most infamous of all were the 'NINJA loans', in which the borrower had No Income, No Job (and no) Assets. Securitization did not stop there. Financial firms oversaw the securitization of commercial real estate mortgages along with many kinds of consumer loans: credit card loans, student loans, and auto loans. Corporate loans were securitized as well, such as leveraged loans and industrial and commercial loans. The resulting bonds – asset-backed securities – proved popular, and securitization soon spread elsewhere. As one textbook on risk management concluded in 2001, 'Sometimes it seems as though almost anything can be securitized.' That was no exaggeration: by the time the crisis hit, securitization had been applied to airplane leases, revenues from forests and mines, delinquent tax liens, radio tower revenues, boat loans, state and local government revenues, and even the royalties of rock bands."

Nouriel Roubini – Stephen Mihm, 2010
(Roubini, Nouriel – Mihm, Stephen (2010): *Crisis Economics. A Crash Course in the Future of Finance.* The Penguin Press, New York, p. 65.)

Two major questions arose in connection with the financing of the mortgage-fuelled housing boom: How was it possible that lenders gave so much money so benevolently to borrowers? And how could a local problem in the American housing finance market endanger the whole (global) financial system? The simplified answer to both questions is securitization.

Prior to the crisis, two major models of mortgage funding had developed:

- The traditional *originate to hold* model, where banks or other similar financial institutions (thrifts like savings and loan associations – S&Ls) made residential mortgage loans to households (referred to as origination) and held them until they were repaid. As lenders were depository institutions, deposits were the major source of funding and were usually guaranteed (up to a certain limit) by the government. We can also refer to this model as the depository based funding of housing finance.
- The new *originate to distribute* model, which evolved after decades of financial innovation, where mortgage loans are sold by their originators to big financial institutions (often parts of the so-called *shadow banking system*) which then transform the pool of mortgages into Mortgage Backed Securities (MBS) or other similar debt securities (a process referred to as securitization) and sell them to investors. The cash flows from the mortgages (interest and principal payments collected and transferred by mortgage servicers) are transformed into cash flows (interest and coupon payments) for security holders, who basically buy the right to receive borrowers' payments. As mortgages are funded by investors from the capital markets, we can also refer to this model as the capital market-based funding of housing finance.

Prior to the financial crisis, the United States of America uniquely became the first country in the world where the majority of housing finance funding came from capital markets, as the majority of mortgages had been securitized. Approximately from the 1980s – instead of the traditional reliance on savings and loans and commercial banks – securitization became a dominant source of funds for US long-term residential mortgages (Green – Wachter (2005): 99). When the crisis started in mid-2007, about 56 % of the home mortgage market was securitized compared with only 10 % in 1980 and less than 1 % in 1970 (Bernanke (2007): 6). Prior to the crisis, securitization rates reached very high levels: by 2007 most newly originated residential mortgages were securitized and only slightly more than 20 percent had not been transformed into MBS. That time there was no major difference between the securitization rates of prime and non-prime mortgages. Thanks to the rapid increase of private-label MBS issuances, the securitization rate of subprime and Alt-A loans reached 81 percent in 2006 (jumping there from a 46 % level in 2001), exactly the same as was the share of securitized prime mortgages –

only jumbo mortgages were lagging behind with "just" 46 percent (Baily et al (2008): 24). Securitization rates for FHA/VA loans were traditionally very high, near to 100 percent (Jaffee (2008): 24).

3.1 American securitization was exceptional in many ways

In other advanced economies with developed financial sectors, securitization was non-existent or played a limited role in mortgage funding.

"At the end 2006, total outstanding MBSs were nearly $6.5 trillion in the United States, but only $400 billion in the euro area and less than $750 billion in the European Union. Even in the United Kingdom, which accounted for about half of European MBS issuance in 2006, less than 20 % of residential mortgages are securitized." (De Michelis (2009): 8).

Outside the United States, banks relying mostly on deposit funding remained the dominant players of the mortgage market; in some countries (notably Denmark and Spain) covered mortgage bonds also played a significant role (Lea (2010): 34), but these – unlike American MBS – were issued by and held on the balance sheets of European banks. In the euro area, residential mortgage-backed securitization and mortgage covered bonds (as a share of funds for mortgages) represented about 21 % of the total stock of housing loans at the end of 2007; securitization alone – albeit rising dramatically in previous years – accounted for less than 13 percent (ECB (2009): 45 – 46).[27] The value of outstanding mortgage covered bonds in the euro area reached almost € 400 billion at the end of

27 Behind the euro zone average great cross-country differences prevailed. True-sale securitization of housing loans, for instance, accounted for about 31 % of the stock of housing loans to households in Spain, 25 % in Netherlands, around 20 % in Portugal and Italy and about 10 % in Ireland, while its share was minimal in Germany and it was basically non-existent in several (usually small) countries like Cyprus, Malta, Slovenia and Finland (ECB (2009): 46).

2007, but it was heavily concentrated in three countries: 39 % in Spain, 34 % in Germany and 16 % in France (ibid.). Although covered bonds are in principle similar to Residential Mortgage Backed Securities (RMBS), there are some significant differences summarized by the Task Force of the Monetary Policy Committee of the European System of Central Banks (ECB (2009): 46 – 47) as follows:

(a) When covered bonds are issued, the cover assets remain on the originator's balance sheet, while RMBS issuance – as a matter of principle – involves transferring the pooled collateral to a special-purpose vehicle (SPV), which then issues the securities; thus in the latter case, the originator and the issuer are not the same entity.

(b) A critical feature of some forms of true-sale securitization is that it allows the originator to remove risks from the balance sheet and thus obtain capital relief. By contrast, covered bonds are used first and foremost to raise funding in a cost-efficient manner.

(c) Unlike RMBSs, covered bonds are "dual recourse" securities. In other words, covered bond investors have a claim: in the first instance against the issuer as well as a preferential claim on the cover pool if the issuer/originator defaults. RMBS investors, by contrast, have no claim vis-à-vis the originator.

(d) The collateral pool backing covered bonds is usually dynamic, implying that underlying assets can be replaced if they mature or no longer meet eligibility criteria. The cover pool for RMBSs, by contrast, is generally static. While covered bonds predominantly have a fixed rate bullet structure, RMBSs generally have floating rates.

(e) Finally, tranching of the collateral pool is a common feature of RMBSs, but not of covered bonds. This enables issuers to tailor individual tranches to specific investor needs and to lower the cost of capital through higher-rated securities.

Considering these differences, the issuance of mortgage covered bonds in Europe cannot be equalized with "real" residential mortgage-backed securitization and thus the gap between the US and the euro zone in reliance on securitization becomes even bigger. European covered bonds originate from the German *Pfandbrief*, which was introduced in 1769 in Prussia, and since then not a single Pfandbrief has failed (Sinn (2010): 114). This is in sharp contrast with the performance of American MBS during the latest crisis.

"In fact, the owner of a Pfandbrief holds a threefold claim. First he holds a claim against the bank. Second, if the bank goes bankrupt, he holds a claim against the bank's mortgage debtor. Third, if the debtor files for personal bankruptcy, the owner of a Pfandbrief has a claim against the real estate, which he can satisfy by selling it to the highest bidder. The claims held by the buyer of an MBS hold little similarity with this. The buyer holds no claim against the bank and not even against the debtor, as the debtor is protected by the non-recourse nature of the mortgage debt and can choose not to redeem his debt if his home has fallen 'under water'. The buyer indeed only holds a claim against the real estate property itself and bears the risk of declining house prices." (Sinn (2010): 113 – 114).

The exceptional character of American housing finance funding has been a consequence of long historic development (summarized in text box No. 1).

Box 1: **Historic Development of American Housing Finance**

Before the 1930s	Mortgage loans were short-term (usually three to ten years) and not amortized, i.e., borrowers paid just the interest but not the principal (the sum they borrowed) until the end of the loan's term, when they faced a final "balloon" payment (some loans were partially amortized). Interest rates were variable; loans required considerable down payments usually above 50 percent of the value of purchased property (consequently LTV ratios were below 50 percent). Prior to 1916, national banks as well as many state banks were prohibited from making real estate loans. Even after 1916, many commercial banks refused to make real estate loans on the grounds that they were "illiquid". In almost every state, state law restricted banks and insurance companies to a maximum loan of 50 percent of the appraised value of a home and limited the maximum term of the loan to five years for a national bank and 10 years for an insurance company. The lenders were building societies, building and loans, mutual savings banks and savings and loans (S&Ls) as well as mortgage banks (from the late 19th century), usually funding the loans with deposits, deposit and investment certificates as well as partially mortgage-backed bonds (MBBs which defaulted in large numbers during the recession in the 1890s and largely disappeared).
1927	The **McFadden Act**, which was designed to put national banks and state banks on an equal footing (and the Douglas Amendment of 1956, which closed a loophole in the McFadden Act) effectively prohibited banks from branching across state lines and forced all national banks to conform to the branching regulations in the state of their location.
1929 – 1933	During the **Great Depression** the ramping up of the unemployment rate caused liquidity and solvency problems for a large number of borrowers, leading to nonpayment of loans. The acute deflation that resulted led to an almost 50-percent drop in the price level of homes (relative to their peak values) and deprived many households of the sufficient income and house (collateral) values to secure bank loans. This caused lenders to refuse refinancing, leading to further defaults pushing up the share of homes in foreclosure to 10 percent at the depth of the Depression. This contributed to large scale bank runs and the insolvency of the whole financial system. Some 9000 bank failures during the depression wiped out the savings of many depositors at commercial banks.

1932	During the Hoover administration, Congress created the **Reconstruction Finance Corporation (RFC)** and adopted the **Federal Home Loan Bank Act** to lend money to banks, railroads and insurance companies in order to help them avoid bankruptcy. During July of 1932, Congress expanded the RFC's mission to include lending to farmers (via the Farm Credit Administration), states and public works projects (via the Works Progress Administration). Under the **Federal Home Loan Bank Act,** the **Federal Home Loan Bank System (FHLBS)** was created – styled after the Federal Reserve System. It has 12 district Federal Home Loan banks, which are supervised by the Office of Thrift Supervision (created later, in 1989). The primary purpose of the legislation was to increase the amount of funds available to local financial institutions that supplied home mortgages. Building and loan associations, savings banks, insurance companies and so on are eligible for membership in the system. Member institutions are required to subscribe for stock of the home loan banks and to absorb gradually the capital, and they may borrow from the banks upon their notes to be secured by the collateral of sound home mortgages. The FHLBS, like the Fed, makes loans to the members of the system (obtaining funds for this purpose by issuing bonds). However, in contrast to the Fed's discount loans, which are expected to be repaid quickly, the loans from the FHLBS often need not be repaid for long periods of time.
The New Deal Banking and Finance Regulation	In order to restart the economy and to prevent future financial meltdowns, the **Roosevelt administration** introduced a **variety of legislation**: the Securities Act of 1933, the Securities Exchange Act of 1934, the Banking Act of 1933, the Banking Act of 1935, the Home Owners' Loan Act of 1933 and the National Housing Act of 1934. **The Banking Act of 1933** (also known as the **Glass-Steagall Act** – because of it having been written by Senator Carter Glass of Virginia and Representative Henry Steagall of Alabama) separated commercial banks (those that accept deposits and lend money) from investment banks (those that underwrite securities). The act prohibited commercial banks from underwriting or dealing in corporate securities (though allowing them to sell new issues of government securities). It also established the **Federal Deposit Insurance Corporation (FDIC)** as a temporary federal agency (it became a permanent agency in 1935) to insure bank deposits and to thereby totally eliminate runs on all of the commercial banks in the United States – be they member or nonmember banks, national-chartered banks or state-chartered banks. (FDIC and later FSLIC deposits were insured up to $5,000 until 1950, $10,000 until 1966, $15,000 until 1969, $20,000 until 1974, $40,000 until 1980 and $100,000 thereafter; the insurance limit was raised to $250,000 in October 2008 during the financial crisis). **The Home Owners' Loan Act of 1933** established the Home Owners' Loan Corporation (HOLC) as an emergency agency under the FHLBB. The HOLC provided low-interest rates and long-term fully amortizing mortgages to homeowners unable to procure financing through normal channels; consequently, the federal government became a mortgage lender. Both the HOLC and the RFC purchased defaulted housing loans and the stock in bankrupt banks and thrifts (S&Ls and mutual savings banks) during the 1930s.
1934	**The National Housing Act of 1934** created the **Federal Housing Administration** (**FHA** in 1936) and the Federal Savings and Loan Insurance Corporation (FSLIC). Two of the main goals of this legislation were (1) to make housing and home mortgages more affordable and (2) to provide depositors in federal savings and loans with deposit protection similar to that which the FDIC provided depositors in commercial banks. Title II of the National Housing Act permitted the Federal Housing Administration to insure mortgages against the risk that the borrower, for whatever reason, would be unable to continue making payments on their mortgage (such mortgages have to meet FHA's underwriting guidelines and get FHA approval). In exchange for such insurance benefits, FHA receives mortgage insurance premiums.
1938	The **Steagall National Housing Act of 1938** eased the underwriting criteria for FHA-insured single-family mortgages. For homes costing no more than $ 6,000, the maximum loan-to-value ratio was increased from 80 percent to 90 percent, the maximum term of the mortgage was increased from 20 years to 25 years and the annual mortgage insurance premium was reduced from 0.5 percent to 0.25 percent of the original amount of the mortgage. The nominal annual interest rate of the mortgage was reduced from 5.5 percent to 5 percent.

1938	**The National Housing Act of 1934** authorized "the establishment of national mortgage associations ... to purchase and sell first mortgages ... and to borrow money for such purposes through the issuance of notes, bonds, debentures or other such obligations." **The Federal National Mortgage Association (Fannie Mae)** was chartered as the first such national mortgage association originally created as a federal government agency. It expanded the availability of residential mortgage finance by buying mortgages from originators. These purchases were funded through debt issuances that were direct obligations of the federal government.
From the 1930s	Thanks to the various efforts of the Roosevelt administration, radically new mortgages were born: fully amortized loans with fixed interest rates (around 5 percent) with down payments considered very low at that time (the minimum was set at 20 percent) and a longer maturity (maximum 20 years), usually with no prepayment penalty and an annual mortgage insurance premium at 0.5 percent of the original amount of the loan.
1944	The **VA loan program** was created as part of the Servicemen's Readjustment Act of 1944 (commonly known as the GI Bill of Rights) to help veterans returning to the United States from WWII purchase single-family homes and to help stimulate the post-war economy. From 1944 to 1952, the VA backed nearly 2.4 million home loans for World War II veterans.
1948	The maximum term of a mortgage rose to 30 years (from an initial maximum of 20 and the 1938 maximum of 25 years).
From 1957	Between 1957 and 1973, every state passed an **enabling** statute for **private mortgage insurance**, ending the FHA's monopoly in this segment of housing finance and leading to a decline in its market share in the 1960s and 1970s.
1966	**Regulation Q** imposed 5.5 % maximum interest rates payable on savings accounts and time deposits.
1968	The **Housing and Urban Development Act** directed that Fannie Mae be split into two pieces: the **Government National Mortgage Association** (GNMA), known as **Ginnie Mae**, a wholly owned government corporation within HUD, and a new **privatized Fannie Mae**, which became a publicly traded corporation (the main reason for this was to remove its debt from the federal government's national debt obligations). However, its main purpose remained unchanged and it continued to have a special status as a GSE.
1970	**Ginnie Mae developed and guaranteed the first mortgage-backed security**, the era of securitization had started. The **Federal Home Loan Mortgage Corporation** (nicknamed Freddie Mac), is created as a government agency to expand the availability of residential mortgages mainly through securitization (issuance of MBS) of mortgages purchased from **S&L**s (Savings & Loans institutions). Until 1989, Freddie Mac was owned solely by the twelve banks of the Federal Home Loan Bank (FHLB) system and by the S&Ls members of the FHLB system; then it became a publicly traded company like Fannie Mae, but its main purpose remained unchanged and it continued to have a special status as a GSE.
1971	**Freddie Mac** began issuing mortgage-backed securities collateralized by conventional and privately-insured mortgages. These securities (called "participation certificates") were direct "pass-throughs" of principal and interest that were classified as investments in mortgages for tax purposes but which because of the agency guarantee represented little risk to the investor. It took another decade for **Fannie Mae** to start issuing mortgage backed securities (from 1981).
1975	Savings and loans in California began to issue **adjustable-rate mortgages** (ARMs): that is, mortgage loans on which the interest rate changes when a market interest rate (usually the Treasury bill rate) changes.
From the 1960s and 1970s	America was transformed from a nation of urban renters to suburban homeowners: the ownership rate among US households rose from 43.6 percent in 1940, the last census year before World War II, to 64 percent by 1980 and after the millennium it peaked at 69 % in 2004. FHA loans and later GSEs and securitization played a key role in this process.
1977	Salomon Brothers and Bank of America created the **first private label mortgage-backed security** (at that time it was only legal in three of the 50 states). Securitization without any government involvement (directly or indirectly through federal agencies or GSEs) was born. Later the housing finance market witnessed the rising importance of private mortgage issuance, securitization and insurance.

The Saving and Loans (S&L) Crisis 1979 – 1995	The federal government's large budget deficits in the 1960s during its involvement in the War on Poverty and the Vietnam War, the first and second oil shocks during the 1970s (which resulted in the ramping up of energy prices) and the change in monetary policy in the mid to late 1970s that adopted money aggregates instead of interest rates as the policy target all contributed to rising inflation and interest rates in the United States. However, regulation Q restricted interest rates for S&Ls on deposits and thus rising inflation resulted in a significant drop in deposit inflows to thrifts – now called "disintermediation" because of their decreasing ability to play the role of financial intermediation. On the other hand, alternative investment opportunities emerged, offering much better return for households (Money Market Mutual Funds – MMMF assets increased from $3.5 billion in 1977 to $180 billion in 1981, more than a 50-fold increase in volume within 4 years). When looking for additional funds, S&Ls faced rising interest rates; on the other hand they were not able to raise the interest on their long-term residential mortgages (whose rates had been fixed at a time when interest rates were far lower). To make things even worse, the severe recession in 1981 – 1982 and a collapse in the prices of energy and farm products hit the economies of certain parts of the country, such as Texas, very hard. As a result, there were defaults on many S&L loans and by the end of 1982 over half of the S&Ls in the United States had a negative net worth and were thus insolvent. S&L regulators – the Federal Home Loan Bank Board (FHLBB) and its deposit insurance subsidiary, the Federal Savings and Loan Insurance Fund (FSLIC), failed to put the insolvent S&Ls out of business as the Reagan administration and Congress failed to provide sufficient funds; they rather opted for deregulation. But it was too late, and in the case of already insolvent S&Ls this often contributed to further deterioration of their state by increasing moral hazard. It also postponed the problems and increased the final bailout bill (estimated around $ 150 billion in 1996).
Financial De-regulation during the 1980s	**Regulation Q** (1966) was phased out between 1981 and 1986. The **Depository Institutions Deregulation and Monetary Control Act** (DIDMCA) of 1980 and the **Depository Institutions (Garn-St. Germain) Act** of 1982 gave expanded powers to the S&Ls and mutual savings banks to engage in new risky activities. These thrift institutions, which had been restricted almost entirely to making loans for home mortgages, now were allowed to have up to 40 % of their assets in commercial real estate loans, up to 30 % in consumer lending and up to 10 % in commercial loans and leases. In the wake of this legislation, S&L regulators allowed up to 10 % of assets to be in junk bonds or in direct investments (common stocks, real estate, service corporations and operating subsidiaries). In 1981, the FHLBB permitted federally chartered member thrifts by regulation to offer alternative variable-rate mortgage instruments. Then in the next year, the Garn-St. Germain Depository Institutions Act empowered state banks and thrifts to offer the alternative variable-rate mortgage instruments that are permitted to their federal counterparts. In 1984 the **Secondary Mortgage Market Enhancement Act** (SMMEA) permitted "nationally recognized statistical rating organizations" (in 1984, Moody's and Standard & Poor's) to rate mortgage pools. Such pools could then be sold as mortgage-related securities if at least one of the rating organizations placed the pool in one of its two top rating categories. The **Tax Reform Act of 1986** eliminated all interest-related personal deductions except for mortgages and home equity loans.
1989	The **Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA)** eliminated the FSLIC (its regulatory responsibilities were given to the FDIC) and the Federal Home Loan Bank Board and created the **Office of Thrift Supervision** (a bureau within the US Treasury Department, whose responsibilities are similar to those that the Office of the Comptroller of the Currency has over the national banks) to regulate thrifts. It also increased the core capital leverage requirement from 3 % to 8 % and imposed the same risk-based capital standards imposed on commercial banks. **FIRREA** provided funds to resolve S&L failures and created the **Resolution Trust Corporation** (abolished on December 31, 1995) to resolve insolvent thrifts. It was made responsible for selling more than $450 billion of real estate owned by failed institutions. After seizing the assets of about 750 insolvent S&Ls, over 25 % of the industry, the RTC sold over 95 % of them with a recovery rate of over 85 %.

1991	The **Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991** recapitalized the FDIC and increased examinations, capital requirements and reporting requirements. It limited the too-big-to-fail policy; a bank would be declared too big to fail (so that all depositors, both insured and uninsured, would be fully protected) only if not doing so would "have serious adverse effects on economic conditions or financial stability".
1990s	The era of **securitization and automation/computerization**. Securitization became a dominant source of funds for US residential mortgages (instead of the traditional reliance on deposit funded loans of thrifts and commercial banks) and – thanks to the development in IT – the use of automated underwriting systems (AUSs) had spread across the industry. At the core of the system is a mortgage scoring model, a statistical technique first used in car loan and credit card markets. It quantifies the level of creditworthiness of borrowers based on historical default/delinquency information particular to the loan specifications. In addition, most AUSs utilize automated property valuation models to streamline or even waive property appraisal requirements in mortgage underwriting, reducing the transaction cost to borrowers and lenders.
1994	The **Riegle-Neal Interstate Banking and Branching Efficiency Act** overturned the McFadden Act (1927) and Douglas Amendment's prohibition of interstate banking. Not only did this act allow bank holding companies to acquire banks in any other state, notwithstanding any state laws to the contrary, but bank holding companies were also allowed to merge the banks they own into one bank with branches in different states. The branching regulations for S&Ls were more liberal than for commercial banks: In the past almost all states permitted the branching of S&Ls, and since 1980 federally chartered S&Ls had been allowed to branch statewide in all states. Since 1981, mergers of financially troubled S&Ls were allowed across state lines and nationwide branching of S&Ls became a reality.
1998	Citicorp and Travelers produced a new company known as "**CitiGroup**" which combined a commercial bank, Citicorp, with a company whose subsidiaries included an insurance company (Travelers), a retail brokerage and asset management company (Shearson Lehman) that had recently been merged with Smith Barney, and a major bond trader and investment bank (Salomon Brothers).
1999	Congress passed the **Gramm-Leach-Bliley Financial Services Modernization Act**, which repealed the sections of the 1933 Glass-Steagall Act mandating the legal separation of commercial banking and investment banking. It eliminated the Bank Holding Company Act of 1956's prohibition on bank underwriting of insurance, helping CitiGroup and allowed banks to underwrite insurance and securities and engage in real estate activities.
By 2007	**Securitization** had become the **dominant** form of housing finance funding. More than half of the outstanding residential mortgages were securitized; securitization rates for newly originated mortgages (including both prime and non-conforming loans) surpassed 80 percent. More than half of newly issued loans were non-agency loans (subprime, Alt-A, HEL and jumbo).

Sources: **Green – Wachter (2005):** *The American Mortgage in Historical and International Context*. Journal of Economic Perspectives, Volume 19, Number 4 (Fall 2005), pp. 93 – 114. **Herzog, Thomas N. (2009):** *History of Mortgage Finance With an Emphasis on Mortgage Insurance*. Society of Actuaries. **Integrated Financial Engineering Inc. (2006):** *Evolution of the U.S. Housing Finance System. A Historical Survey and Lessons for Emerging Mortgage Markets*. U.S. Department of Housing and Urban Development – Office for Policy Development and Research, Washington, D.C. **Mishkin, Frederic S. (2004):** *The Economics of Money, Banking, and Financial Markets*. 7th ed. Pearson – Addison-Wesley, Boston, MA.

After the Savings and Loans debacle, securitization was considered to be a solution to the problems: a new and better form of financial intermediation which provided funds from long-term (MBS) investors to long-term (mortgage) borrowers. It seemed that financial innovation had finally overcome the mismatch between long-term loans and short-term deposits used for their funding (the traditional problem of the originate to hold model).

3.2 From financial innovation to financial alchemy

The securitization process could be divided to two major forms, agency and non-agency securitization, and is described as follows:[28]
Primary mortgage lenders (thrifts, commercial banks and other financial institutions) lend various types of mortgage loans to borrowers and thereafter sell the set of these loans (called pools) to a third-party (GSEs or Special Purpose Vehicles/Conduits, parts of the so-called *Shadow Banking System* operating at the *secondary market*). These entities then package together a great number (usually thousands) of geographically dispersed mortgages, transform them into Mortgage Backed Securities (MBS) and sell these MBS on the open market to various (mostly large institutional) investors. The mortgages were selected from geographically diverse areas to protect the overall pool from any local housing market shocks. Basically, MBS issuers sell the rights to the principal and interest payments made by mortgage borrowers to the MBS investors. The cash flows from underlying mortgages (collected by mortgage servicers for some fees) are transformed into interest and coupon payments for MBS holders, pools of mortgages serve as collateral for the securities, and investors have a claim on the underlying pool. The set of rules that dictates how money received from the collateral will be distributed to MBS holders is called the *structure*.

If mortgages are insured by the FHA or VA and purchased by Ginnie Mae, the MBSs are explicitly guaranteed by the US federal government (Ginnie Mae also issues its own version of a Collateral Mortgage Obligation – CMO called a *Real Estate Mortgage Investment Conduit* or *REMIC*). If mortgages fit certain rules and are originated abiding by GSEs' underwriting guidelines (these are called con-

28 For a more detailed description of securitization see: Ashcraft – Schuermann (2008): *Understanding the Securitization of Subprime Mortgage Credit.* Federal Reserve Bank of New York Staff Reports no. 318, New York; and FCIC – Financial Crisis Inquiry Commission (2011): *The Financial Crisis Inquiry Report. Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States.* U.S. Government Printing Office, Washington D.C., Chapter 3, pp. 38 – 52.

forming mortgages), they can be sold to Fannie Mae and Freddie Mac (two Government Sponsored Enterprises). Fannie and Freddie provide a guarantee that investors in their MBS will receive timely payments of principal and interest (if the borrower for one of the underlying mortgages fails to make his payment, the GSE that issued the MBS will pay it instead). With this guarantee and implicit government backing GSE securities (and bonds) were considered safe, paying lower interest rates than private-label MBS. MBS issued by Ginnie Mae and GSEs are together referred to as agency MBS benefiting from direct or indirect government backing.

Mortgages that do not qualify for GSE standards and are bought and securitized by private entities are called non-conforming loans; the MBS created from them are referred to as non-agency or private-label MBS. The securitization of non-conforming (jumbo, subprime, Alt-A and HEL) mortgages was a bit of a different process considering private institutions' capital disadvantage and non-existent government backing. The purchaser or the originator of the loans (*sponsor* of the securitization) usually transferred the acquired pools of mortgages to a newly created off-balance sheet entity called a Special Purpose Vehicle (SPV). The SPV received the cash flow from underlying mortgages, securitized them and sold the MBS to the investors. Rather then selling one MBS based on the entire pool of mortgages, the SPV issued various classes of securities referred to as *tranches* based on different credit risk and return. These operated like a waterfall: the senior tranche (with the highest credit rating and lowest risk and interest) had a preferred claim on the stream of returns generated by the mortgages; once all the senior tranche securities are paid, the mezzanine holders are paid next, and the equity tranche (with the lowest credit rating and highest risk and interest) receive whatever is left (Baily et al (2008): 25). This process, called subordination (because more junior, i.e. mezzanine and equity, tranches were subordinated) required a credit rating for the tranches issued by one of the three major credit rating agencies (Fitch Ratings, Moody's and Standard & Poor's). As defaults on underlying mortgages were likely to be absorbed by junior tranches, these rating agencies were willing to give the best (AAA) rating to the senior

tranche.[29] As a consequence, the holders of the senior tranche had an asset that was less risky than the underlying pool of mortgages behind the MBS (ibid.).

Private MBS sponsors used a set of credit-enhancement strategies to receive the best ratings for the highest share of tranches. These credit-enhancement tools were the following[30]:

1. The above mentioned subordination. The higher the subordination (total size of junior tranches relative to a senior one), the safer the senior tranche.

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29 The FCIC Preliminary Staff Report describes a typical MBS tranche division and an example of its default as following. In the case of a typical MBS, the AAA senior bonds made up 92 percent of the principal amount of debt issued by the SPV, AA bonds accounted for 3 percent, mezzanine BBB bonds made up 4 percent and the residual tranche amounted to 1 percent. Zimmerman (*Defining Nonagency MBS*, 2006, p.109 in: Fabozzi, ed.: *The Handbook of Mortgage-Backed Securities*.) gives an example of a typical subprime MBS in which cumulative losses on mortgages in the SPV were expected to amount to 4 percent of the total principal amount. If the MBS does indeed experience such a 4 percent loss on its mortgage assets, then 4 percent of the total principal amount on its bonds would default. Because of the SPV's subordination structure, these losses would first be applied to the residual tranche. The residual tranche, which accounts for 1 percent of the principal amount of the SPV's bonds, would fully default, paying nothing. That leaves 3 percent more of the total principal amount in losses to apply to the next most junior tranche, the mezzanine BBB tranche. Since the mezzanine BBB tranche totals 4 percent of the deal, the 3 percent left in losses would reduce its actual payments to 1 percent, meaning that 75 percent of the BBB bonds' principal value would be lost. The AA and AAA bonds, however, would pay their holders in full. In our simple example, the junior tranches below the AA and AAA bonds are large enough to fully absorb the expected loss on the SPV's mortgages. (FCIC – Financial Crisis Inquiry Commission (2010): *Securitization and the Mortgage Crisis. Preliminary Staff Reports,* p. 6.)

30 See Baily et al. (2008): *The Great Credit Squeeze: How It Happened, How to Prevent Another*, pp. 26 – 28; and FCIC – Financial Crisis Inquiry Commission (2010): *Securitization and the Mortgage Crisis. Preliminary Staff Reports,* pp. 6 – 8.

2. Over-collateralization. Usually the principal balance of the underlying mortgages would be higher than the promised principal balance on debt securities issued by the SPV. Thus, some of the underlying mortgages (part of the collateral pool) could default without endangering any of the MBS payments.
3. Excess spreads. The total amount of promised cash flow from the mortgages exceeded the promised payments to security holders, fees to the issuer and any other expenses.

Despite the use of these various tools, credit enhancement did not in fact reduce the overall risk of the underlying mortgage pool; it just rearranged it, concentrating the risk on more junior tranches (this seems to be evident, but many investors certainly failed to understand it). The creation of Collateralized Debt Obligations (CDOs) represented a further possibility of credit-enhancement: During this "second round of securitization" or "re-securitization", Asset Backed Securities (ABS including MBS, notable their more junior tranches) were resliced, repackaged and turned into CDOs for sale to investors. This process was pretty much similar to MBS creation: Just instead of mortgage pools, (junior) security pools were sliced and repackaged and instead of mortgage cash flows, ABS cash flows were transformed to CDO cash flows. In this mirage transformation risky junior tranches of MBS (which already represented claims on non-conforming, riskier pools of mortgages) were transformed into AAA-rated senior CDO tranches. Regardless of the ratings, it remained just a mirage and many of these CDOs (including their "senior" AAA-rated tranches) experienced heavy losses during the crisis. In addition, the CDO is such a complicated structured finance product that it was almost impossible to understand what was behind it and to determine the risk it represented.

Cautious investors of MBSs or CDOs had the opportunity to protect themselves against the risk of default by buying insurance. This was possible either by insuring the security at a private MBS insurer (like Monolines, e.g. MBIA or Ambac) or by entering into a Credit Default Swap (CDS) contract with a third company (for example the insurance giant AIG). In the later case, this third party (in exchange for regular payments from the buyer) agreed that if the "reference entity" (the trust that issued the MBS or CDO) experienced a "credit event" (default) it would pay a fixed amount to the buyer of CDS in compensation. Thus, CDS contracts are very much like insur-

ance but there is a huge difference which led to serious consequences during the latest crisis. With insurance, the insurer has to have an insurable interest under which they can demonstrate a potential loss should the default occur (Buckley (2011): 4). To put it simply, to insure a car you have to own one. But a CDS purchaser can use it to speculate on the default of a loan the purchaser *does not own*, consequently these "naked credit default swaps" can inflate potential losses and corresponding gains on the default of a loan or institution (FCIC (2011): 50). The CDS also differs from insurance because there is no legal limit to the number of credit default swaps that can be entered into in respect of a particular risk (Buckley (2011): 4). To return to the previous comparison, CDS is like "insuring" somebody else's car 10 or 100 times. In the case of MBS or CDO totaling let's say 1 billion USD, it was possible to enter into CDS contracts for various parties in volumes of tens or hundreds of billions. This is betting rather than insurance. During the latest financial crisis, CDS contracts played a major role in spreading the crisis and multiplying its effects. To make things worse, CDS contracts – unlike some other derivatives – were exempt from any federal or state regulation and there were no capital adequacy standards set for the sellers.[31]

31 The principal legislation governing derivatives markets is the Commodity Exchange Act of 1936, which originally applied only to derivatives on domestic agricultural products. In 1974 Congress amended the act to require that futures and options contracts on virtually all commodities, including financial instruments, be traded on a regulated exchange, and created a new federal independent agency, the Commodity Futures Trading Commission (CFTC), to regulate and supervise the market. Outside of this regulated market, an over-the-counter (OTC) market began to develop and grow rapidly from the 1980s. Efforts by the CFTC to regulate OTC derivatives failed in the Congress. In December 2000 Congress passed and President Clinton signed the Commodity Futures Modernization Act of 2000 (CFMA), which in essence deregulated the OTC derivatives market and eliminated oversight by both the CFTC and the SEC. Before the CFMA was passed, there was uncertainty about whether or not state insurance regulators had authority over credit default swaps. In June 2000 in response to a letter from the law firm of Skadden, Arps, Slate, Meagher & Flom, LLP, the New York State Insurance Department determined that "naked" credit default swaps did not count as insurance and were therefore not subject to regulation (FCIC (2011): 46 – 50).

"In the run-up to the crisis, AIG, the largest U.S. insurance company, would accumulate a one-half trillion dollar position in credit risk through the OTC market without being required to post one dollar's worth of initial collateral or making any other provision for loss. AIG was not alone. The value of the underlying assets for CDS outstanding worldwide grew from $6.4 trillion at the end of 2004 to a peak of $58.2 trillion at the end of 2007. A significant portion was apparently speculative or naked credit default swaps." (FCIC (2011): 50).

All the above mentioned actors in the chain of this new originate to distribute model were profiting quite a long time from securitization: the mortgage brokers, originators and servicers pocketed their fees and commissions (for originating and servicing the loan); SPVs (of big commercial and investment banks) made profits from the difference between lower interest rates paid to MBS investors and higher interest rates earned from mortgages; credit rating agencies were rewarded with fees for giving ratings to MBS tranches; investors enjoyed higher returns from MBS than from other securities with similar ratings and finally mortgage insurers or CDS contract sellers also collected their regular fees. This chain of profits certainly worked while borrowers (the first, crucial element in the chain) were paying their mortgages and delinquencies and defaults stayed at a reasonably low level. However, as we explained above, the borrowers' ability to pay became increasingly dependent on the possibility of refinancing, closely linked to never-ending house price appreciation. When house prices started to fall, the whole chain of profits turned to a chain of losses. Rising delinquencies and foreclosures triggered a domino effect where all the elements of the securitization chain started to fall like one domino after another. It is also important to understand that not only was money streaming back and forth in this securitization chain but that it also worked as a chain of risk transfer. By selling the loans, originators (lenders) also passed the credit risk onto the SPVs and these by transforming the mortgages to MBS and selling them forwarded the risk onto investors. Thus, the risk was concentrated in the hands of MBS and CDO investors or – if they paid insurance or entered a CDS contract – in the hands of insurers and CDS sellers. As many of these investors (usually large bank holding companies, investment banks, hedge funds, pension and investment funds, sovereign wealth funds, insurance companies, etc.) came from all over the world, securitization spread the credit risk (of American residential mortgages) to the whole global financial sector. This way

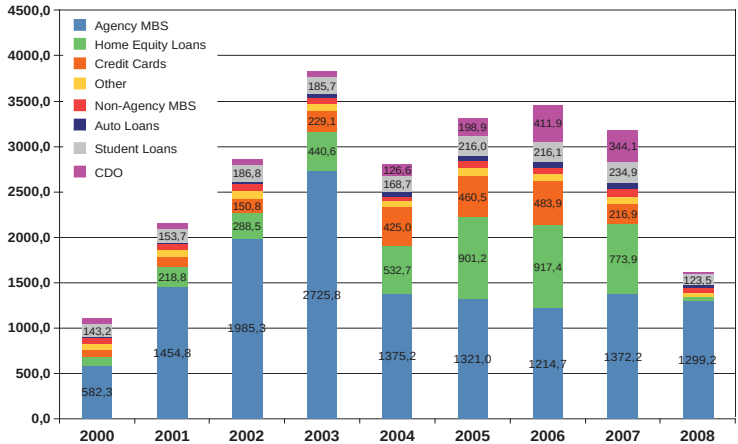
the US housing finance meltdown threatened to tear down the whole global financial system – big foreign institutional investors were among the dominos falling in the securitization chain:

"Instead of putting their own money at risk, they (mortgage originators) pocketed fat commissions on signature of the original loan contracts and then resold their loans in bulk to Wall Street banks. The banks, in turn, bundled the loans into high-yielding residential mortgage-backed securities (RMBS) and sold them on to investors around the world, all eager for a few hundredths of a percentage point more return on their capital. Repackaged as collateralized debt obligations (CDOs), these subprime securities could be transformed from risky loans to flaky borrowers into triple-A rated investment-grade securities... The key to this financial alchemy was that there could be thousands of miles between the mortgage borrowers in Detroit and the people who ended up receiving their interest payments. The risk was spread across the globe from American state pension funds to public health networks in Australia and even to town councils beyond the Arctic Cycle. In Norway, for example, the municipalities of Rana, Hemnes, Hattjeldal and Narvik invested some $120 million of their taxpayers' money in CDOs secured on American subprime mortgages. At the time, the sellers of these 'structured products' boasted that securitization was having the effect of allocating risk 'to those best able to bear it'. Only later did it turn out that risk was being allocated to those least able to understand it. Those who knew best the flakiness of subprime loans – the people who dealt directly with the borrowers and knew their economic circumstances – bore the least risk. They could make a 100 percent loan-to-value 'NINJA' loan (to someone with No Income No Job or Assets) and sell it on the same day to one of the big banks in the CDO business. In no time at all, the risk was floating up a fjord." (Ferguson (2008): 268 – 269).

As the housing boom was mostly financed by mortgage loans and most of these loans – through securitization – were financed by MBS, it is not a surprise that parallel to the buildup in residential mortgage debt ABS and CDO issuance also soared. Between 2003 and 2007 (as Figure 5 illustrates) the yearly issuance was around 3 trillion dollars – most of which was made out of mortgage-backed securities. Parallel to the increase of non-conforming mortgage lending, the share of non-agency MBS collateralized by these loans also dramatically increased. The CDO market witnessed an even

faster expansion. The first CDOs were issued in 1987. However, annual global issuance did not exceed USD 5 billion until 1996; later, between 1997 – 2003, it reached USD 100 billion and from 2004 its volume practically doubled from one year to the next with annual issuance peaking at USD 440 billion in 2006 (Király et al. (2008): 20). Most of these CDOs were denominated in US dollars and were backed by MBS, thus by American residential mortgages.

Figure 5: **ABS** (Asset Backed Securities) **and CDO** (Collateralized Debt Obligations) **Issuance in the United States** (in billions of US dollars)



Notes: Data on CDO refer to global CDO issuance denominated in US dollars. Non-Agency includes RMBS (residential mortgage-backed securities) and CMBS (commercial mortgage-backed securities).

Source: **SIFMA – Securities Industry and Financial Markets Association.**

Starting from mid-2007 the financial crisis basically wiped out the whole mortgage-related private securitization industry. Global CDO issuance dropped to $4.2 billion in 2009 (i.e. more than 100 times less compared to 2006) and was predominantly backed by corporate loans and bonds (not by mortgage-backed securities), while private label RMBS issuance ceased to exist in the United States in 2010 (SIFMA (2010): 9, 16). The total collapse of the market was prevented only by the de facto nationalization of Fannie Mae and Freddie Mac, so these two GSEs could continue to purchase mortgages and sell agency MBS which became the direct obligation of the US federal government.

3.3 Banks in shadow – a huge but fragile and opaque network

Prior to the crisis, a growing fraction of financial intermediation migrated outside the traditional banking system and – instead of deposit-based funding – the capital market-based funding of housing finance became dominant. This – among many other things – was orchestrated by the so-called shadow banking system (also known as parallel banking system). With liabilities peaking at nearly $20 trillion in March 2008, shadow banking significantly surpassed the traditional banking system (Pozsar et al. (2010): 4, FCIC (2011): 32). Thanks to expanding securitization, the shadow banking system provided the increasing majority of funding for home mortgages. Pozsar et al. (2010: 20 – 41) identified three distinct subgroups of the US shadow banking system:[32]

1. The government-sponsored shadow banking sub-system: made up of Government Sponsored Enterprises (GSEs), e.g. Fannie Mae and Freddie Mac, which purchased, securitized and held mortgages, issued and held MBS and thus took part in loan processing and funding (but not the origination) process.
2. The "internal" shadow banking sub-system: mostly represented by certain parts of large financial holding companies (FHC), the existence of which was legitimized by the abolishment of the Glass-Steagall Act of 1932 and codified by the Gramm-Leach-Bliley Act of 1999 (see the Text Box 1 above). There were bank, broker-dealer and asset management subsidiaries and off-balance sheet entities (conduits, SPVs and SIVs) of large FHC, with various tasks including loan origination and warehousing, securitization (ABS and

32 The term shadow banking system was first used by PIMCO managing director Paul McCulley at the 2007 Jackson Hole Conference, sponsored by the Federal Reserve Bank of Kansas City. For a more detailed analysis of the shadow banking systems see: FCIC – Financial Crisis Inquiry Commission (2011): *The Financial Crisis Inquiry Report. Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States.* U.S. Government Printing Office, Washington D.C., Chapter 3, pp. 27 – 38; and Pozsar et al. (2010): *Shadow Banking*. Federal Reserve Bank of New York Staff Reports, no. 458, New York.

CDO issuance) and holding of ABS and CDO. Some parts of major European, Japanese and other foreign FHC were also heavily involved in this new type of financial intermediation at the American market and thus should be considered as part of US shadow banking.

3. The "external" shadow banking sub-system: with investment bank holding companies (also known as diversified broker dealers – DBDs), namely the Wall Street big five: Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley. This "external" sub-system was less of a product of regulatory arbitrage (putting activities off-balance sheet in the case of FHC to bypass regulatory requirements like capital adequacy ratios) and more a product of vertical integration and gains from specialization. Investment banks – unlike FHC – also had no classical commercial banking (depository) subsidiaries.

Prior to the crisis not only did mortgage origination and funding move out increasingly from the traditional into the shadow banking system, but also the market consolidated. As of 1990, the top 25 mortgage originators made approximately 28 percent of the industry total of roughly $500 billion, whereas in 2005 the top 25 originators market share rose to approximately 85 percent out of an industry total of $3.1 trillion (Bethel et al. (2008): 7). The issuance, holding and insurance of MBS was similarly concentrated. Table 6 shows the main actors (mortgage originators, MBS issuers, holders and insurers) of private-label securitization prior to the crisis. Many of the actors (those from the "internal" shadow banking sub-system) were present across the whole vertical chain of business, having their mortgage originating, MBS issuing and warehousing parts.

Table 6: **Main Actors of the (Private-label) Securitization Process** (originate to distribute model in 2007)

Top Subprime Mortgage Originators 2006	Top MBS Issuers (Sponsors)	Rating Agencies	Top MBS Holders	Top Insurers
1. HSBC Finance, IL	Countrywide Financial	Standard & Poor's	Freddie Mac	MBIA
2. New Century Financial, CA	Lehman Brothers		Fannie Mae	
3. Countrywide Financial, CA	Wells Fargo & Co.		Citigroup Inc	Ambac
4. CitiMortgage, NY	Washington Mutual		ING Bank	
5. WMC Mortgage, CA	Bear Stearns		Bank of New York Mellon	FSA
6. Fremont Investment & Loan, CA	JPMorgan Chase		FHLBank San Francisco	
7. Ameriquest Mortgage, CA	Deutsche Bank		Washington Mutual	XL Capital
8. Option One Mortgage, CA	Residential Funding Corp.		Bank of America Corp.	
9. Wells Fargo Home Mortgage, IA	Merrill Lynch	Moody's	Wachovia Corp.	FGIC
10. First Franklin Financial Corp, CA	Morgan Stanley		Wells Fargo & Co.	
11. Washington Mutual, WA	IndyMac		FHLBank Atlanta	Assured Guaranty
12. Residential Funding Corp., MN	Goldman Sachs		Countrywide Bank, FSB	
13. Aegis Mortgage Corp., TX	Citigroup		State Street Corp.	CIFG
14. American General Finance, IN	Bank of America Corp.		FHLBank Pittsburgh	
15. Accredited Home Lenders, CA	RBS Greenwich Capital		IndyMac Bank, FSB	
16. BNC Mortgage, CA	Option One		FHLBank Indianapolis	
17. Chase Home Finance, NJ	Credit Suisse		FHLBank Boston	
18. Equifirst, NC	Barclays	Fitch Ratings	Capital One Financial Corp.	
19. NovaStar Financial, KS	UBS Warburg		FHLBank Seattle	
20. Ownit Mortgage Solutions, CA	American Home Mortgage		Commerce Bancorp	
21. ResMae Mortgage Corp., CA	CIT Group		FHLBank Chicago	
22. Mortgage Lenders Network USA, C	Ameriquest Mortgage		U.S. Bancorp	
23. ECC Capital Corp., CA	HSBC		Citizens Financial Group	
24. Fieldstone Mortgage Company, MD	Thornburg Mortgage		M&T Bank Corp.	
25. Nationstar Mortgage, TX	Nomura		JPMorgan Chase	

Notes: All rankings refer to the year 2007 except subprime mortgage originators (ranked as of 2006). Firms that have subsequently declared bankruptcy or been placed into conservatorship or firms that have subsequently been acquired are marked with grey color.

Source: **Bethel – Ferrell – Hu (2008):** *Legal and Economic Issues in Litigation Arising from the 2007 – 2008 Credit Crisis.* Harvard John M. Olin Center for Law, Economics and Business, Discussion Paper 10/2008, Cambridge, MA, p. 82; **EIM (2007):** *Subprime Mortgages*. E.I.M. S.A., Nyon, Switzerland, p. 18 (based on Inside B&C Lending data); and **FCIC – Financial Crisis Inquiry Commission (2010):** *Securitization and the Mortgage Crisis. Preliminary Staff Reports.* FCIC, Congress of the United States, Washington D.C. pp. 13, 17 based on Inside Mortgage Finance (2009) data.

Table 6 also provides evidence of the fragility of the shadow banking system. Many of its former actors declared bankruptcy, were placed into conservatorship or have been acquired by other financial institutions; the remaining ones also faced huge write downs (and usually needed some kind of government help to survive) due to their exposure to mortgage-related securities. The vulnerability of the shadow banking system to financial stress was a consequence of several factors, the following ones being the most important (FCIC (2011): 27 – 38):

(1) *High leverage*. Financial intermediaries financed themselves largely through debt, keeping their own capital (shareholders equity) relative to assets and liabilities as low as possible. Higher leverage (total debt or total assets divided by stockholders' equity) increases the profitability for equity investors, as it allows the financial institutions to engage in more potentially profitable activities with the same amount of equity invested (in other words it potentially increases the profit per share). When asset prices are rising (as they were prior to the crisis) leverage among financial institutions usually rises parallel to this, making leverage pro-cyclical. Adrian and Shin (2008) provide empirical evidence for this.[33] Bank holding companies were leveraged at 10- to 20-to-1 prior to the crises, less regulated investment banks 30- to 40-to-1 and special purpose entities (off-balance sheet entities created to circumvent capital adequacy ratios) were even more leveraged as high as 100-to-1. With rising leverage (and thus relatively lower capital) the banks are increasingly vulnerable to unexpected losses. For example, a leverage of 20:1 transforms a 5 percent realized loss in

33 Empirical evidence implies that investment bank leverage is pro-cyclical: During booms banks increase their leverage, during troughs they reduce it. This is not only due to the rise in the value of total assets (during a boom cycle) but also due to the management of the overall value at risk (VaR) – the risk of loss on banks' asset portfolios. Since measured risk is countercyclical – low during booms and high during busts – the banks' efforts to control risk will lead to procyclical leverage. During a boom cycle a lower value at risk allows banks to expand their balance sheet and increase leverage. See: Adrian – Shin (2008): *Liquidity, Monetary Policy, and Financial Cycles.* Current Issues in Economics and Finance (Volume 14, 1/2008), Federal Reserve Bank of New York.

the value of assets into a 100 percent loss of initial capital; thus, an investor holding a highly leveraged asset could lose all their capital even when default rates were low (Mizen (2008): 539).

(2) *Reliance on short-term funding*. GSEs, investment banks and Structured Investment Vehicles (SIVs) of FHC were holding a large part of MBSs and CDOs as assets and financed them through the issuance of short-term debt (repurchase agreements, commercial paper, asset-backed commercial paper, medium term notes, securities lending, etc.). Short-term funding increased the fragility of shadow banking because assets were long-term and largely illiquid. By "borrowing short and lending long", shadow banking relied on the willingness of investors to fund its activities (with cheap credit) and constantly needed to "roll over" its liabilities. As the maturity of their liabilities often declined to as short as one day, shadow banking entities (especially investment banks) completely falsified the praised benefit of securitization, i.e. that it is providing financial intermediation between long-term borrowers and long-term lenders and thus is solving the mismatch between long-term mortgages and short-term deposits in the traditional originate to hold model. Shadow banks actually funded the purchase of MBS and CDO with much shorter terms and much less "sticky" sources than any traditional retail deposits. This fragility is well illustrated in the Lehman Brothers bankruptcy report:

"Lehman maintained approximately $700 billion of assets, and corresponding liabilities, on capital of approximately $25 billion. But the assets were predominantly long term, while the liabilities were largely short term. Lehman funded itself through the short term repo markets and had to borrow tens or hundreds of billions of dollars in those markets each day from counterparties to be able to open for business. Confidence was critical. The moment that repo counterparties were to lose confidence in Lehman and decline to roll over its daily funding, Lehman would be unable to fund itself and continue to operate. So too with the other investment banks, had they continued business as usual. It is no coincidence that no major investment bank still exists with that model." (Valukas (2010): 3 – 4)

(3) *Lack of explicit government support*. Unlike commercial banks and thrifts, the shadow banking system prior to the crisis did not have any explicit government support (deposit insurance

and access to the Fed's discount window).[34] This fact made creditors much more nervous when first significant losses of shadow banks' assets appeared and this lead to a dramatic increase of the cost of funding (soaring interest rates and the "credit crunch", basically the refusal of further funding of shadow bank activities). Paradoxically, shadow banking, which surpassed traditional banking in bank-like activities (i.e. it was doing basically the same thing as traditional banks), was much less regulated and lacked explicit government guarantees and access to the Fed "creditor of last resort" facilities. "*The shadow banking system consists of financial institutions that look like banks, and borrow and lend and invest like banks, but – and here's the important part – are not regulated like banks*" (Roubini – Mihm (2010): 77).

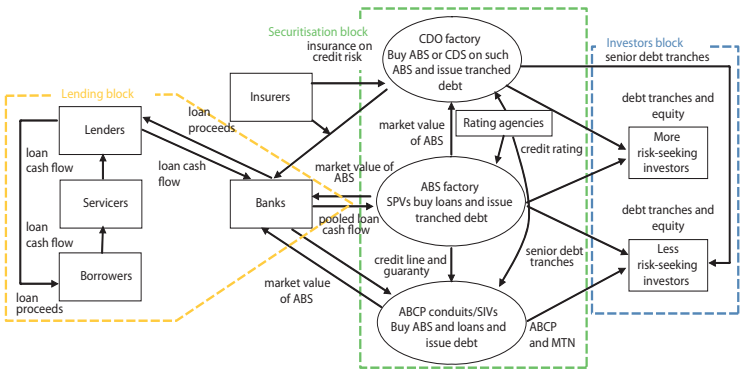
Figure 6 provides an overview of the originate to distribute model, its main actors (including the shadow banking system in the "securitization bloc") as well as the chain of financing and risk transfer between them. In this highly complicated model many investors were sitting too far away from mortgage originators, completely unable to control or at least monitor their underwriting practices and understand the complexity and the risk of products that had been created from mortgages. Fed Chairman Ben Bernanke addressed this issue as follows:

"A key function of efficient capital markets is to overcome problems of information and incentives in the extension of credit. The traditional model of mortgage markets, based on portfolio lending, solved these problems in a straightforward way: Because banks and thrifts kept the loans they made on their own books,

34 Depository institutions, including commercial banks, thrifts, credit unions, federal savings banks and industrial loan companies, benefit from federal deposit insurance (by FDIC) and access to official liquidity backstops from the discount window (of the Fed). Insurance companies benefit from guarantees provided by state guaranty associations. Defined benefit private pensions benefit from insurance provided by the Pension Benefit Guaranty Corporation (PBGC), and public pensions benefit from implicit insurance provided by their state, municipal or federal sponsors. The Small Business Administration, Department of Education, and Federal Housing Administration each operate programs that provide explicit credit enhancement for private lending (Pozsar et al. (2010): 9).

they had strong incentives to underwrite carefully and to invest in gathering information about borrowers and communities. In contrast, when most loans are securitized and originators have little financial or reputational capital at risk, the danger exists that the originators of loans will be less diligent. In securitization markets, therefore, monitoring the originators and ensuring that they have incentives to make good loans is critical. I have argued elsewhere that, in some cases, the failure of investors to provide adequate oversight of originators and to ensure that originators' incentives were properly aligned was a major cause of the problems that we see today in the subprime mortgage market." (Bernanke (2007): 7)

Figure 6: **The Originate to Distribute Model and its Main Actors**



Notes: ABCP – Asset Backed Commercial Paper; ABS – Asset Backed Securities; CDO – Collateralized Debt Obligation; CDS – Credit Defaults Swap; MTN – Medium Term Notes; SIV – Structured Investment Vehicle; SPV – Special-Purpose Vehicle.

Source**: Király – Nagy – Szabó (2008):** *Contagion and the beginning of the crisis – pre-Lehman period.* Magyar Nemzeti Bank Occasional Papers 76. Budapest, p. 20.

The lack of adequate oversight was just one part of the *investor illusion* regarding structured finance products. Mortgage originators, rating agencies and investors heavily relied on history-based models to evaluate possible future losses. They applied the characteristics of mortgages to these models (like credit scores, LTV ratios, documentation of income, whether the mortgages were for the borrower's primary residence or not, whether they were first lien or not, etc.) and compared it with historical default rates on similar mortgages. The problem was that these "historical" de-

fault rates were largely from the years 1992 until the early 2000s – a period when home prices rose only moderately, speculation in houses was negligible, non-prime loans still represented just a small fragment of the market and underwriting standards were tighter (Baily et al (2008): 33, Buffet (2009): 14). "*They then made this experience a yardstick for evaluating future losses. They blissfully ignored the fact that house prices had recently skyrocketed, loan practices had deteriorated and many buyers had opted for houses they couldn't afford. In short, universe "past" and universe "current" had very different characteristics.*" (Buffet (2009): 14) Investors also extensively relied on credit ratings given by rating agencies. However, these agencies were many times in clear conflict of interest as they were not only paid by the issuer (with an up-front fee) for providing a rating of the assets, but they were also giving advice to the same clients (for another fee) on how to improve those ratings and produce the highest possible share of senior tranches in the securitization process (Mizen (2008): 551). Rating agencies were also not liable for erroneous ratings through private litigation. They gave default ratings, but many investors misinterpreted them and treated them as ratings for market and liquidity risk as well. Investors 'became accustomed' to a AAA-rated investment being at the same time liquid (like in the case of government or corporate bonds); however, in the case of structured securities, a good credit rating did not imply low liquidity risk (Király et al. (2008): 17). Nevertheless, bond investors considered their highly rated securities as liquid and they treated them as quasi deposits, which represented another trap of the investor illusion (ibid.).

On the other hand, many players in the securitization process – including investors – were at least partially aware of the bubble they were creating but until the burst there was money to be made for everyone in the "chain of profit". It is hard to believe that so many huge banks and financial investors (with large analytical and risk assessment/management units) completely missed the risks of securitization. This is especially true in the case of investment banks – the MBS and CDOs created by their SPVs often ended up as assets in their own SIVs, thus one entity of the holding was buying securities created by the other. Rather rational behavior characterized many actors; they stretched short-term profit maximalization to breaking point, increasing leverage to dangerous levels regardless of rising vulnerability. CEOs and top managers were usually awarded with bonuses and options for this behavior. The wrong

incentives were put by the shareholders, most of whom preferred short-term profits, not long-term stability. In theory, shareholders should do exactly the opposite because it is their money at stake. But the world of finance was largely an exception from this general rule. Financial firms rely far more heavily on borrowed money to finance their operations than ordinary corporations and considering that leverage ratios were extended to the hilt prior to the crisis shareholders had relatively little money at stake. On the other hand they enjoyed fairy tale profits; for risking their relatively small equity shares they were winning big. The return on equity (after tax) of the five Wall Street investment banks was between 16.9 and 26.7 percent in 2006 and shareholders made sure to get paid out as much money in dividends as possible in order to shelter it from risks: "*It was symptomatic that the investment bank Bear Stearns paid out dividends in the amount of 76 percent of book profits in 2007, shortly before its bankruptcy*" (Sinn (2010): 77 – 78). Bankers were awarded with staggering bonuses: "*In 2005 the big five firms paid $25 billion in bonuses; in 2006 they paid $36 billion; and a year later $38 billion. More to the point, the ratio of bonuses to base pay skyrocketed. In 2006 the average bonus accounted for 60 percent of total compensation at the five biggest investment banks*" (Roubini – Mihm (2010): 69). Supported by these incentives bank managers were mostly risking the money of creditors (and taxpayers), not the shareholders. "*The problem was not that bank managers did not act in the interest of shareholders, but that shareholders gambled with the money of creditors and taxpayers*" (Sinn (2010): 88). Investors who put their money into shadow bank products also counted rationally with guarantees from GSEs or paid for insurance in the case of private-label MBS or CDOs. They also relied on probable government support in the case of institutions "too big to fail", like GSEs or large banks and insurance companies (see next chapter). This is not to say that they completely understood the complexity of securitization, shadow banking or the risk they faced; however, most of them behaved rationally from the viewpoint of short-term profit maximalization or pure self-interest. The temptations were just too strong. As Chuck Prince, former CEO of Citigroup commented concerning the incentives facing the investment banks: "*As long as the music is playing, you've got to get up and dance. We're still dancing.*" (cited by Mizen (2008): 552) As almost everyone was "dancing" while the music played, interlinked actors created a hugely complex, opaque network which dramatically increased systemic risk. Billionaire Warren Buffett,

Chairman and CEO of Berkshire Hathaway commented on securitization as follows:

"Indeed, Derivatives are dangerous. They have dramatically increased the leverage and risks in our financial system. They have made it almost impossible for investors to understand and analyze our largest commercial banks and investment banks. They allowed Fannie Mae and Freddie Mac to engage in massive misstatements of earnings for years. So indecipherable were Freddie and Fannie that their federal regulator, OFHEO, whose more than 100 employees had no job except the oversight of these two institutions, totally missed their cooking of the books... Recent events demonstrate that certain big-name CEOs (or former CEOs) at major financial institutions were simply incapable of managing a business with a huge, complex book of derivatives. Include Charlie and me in this hapless group: When Berkshire purchased General Re in 1998, we knew we could not get our minds around its book of 23,218 derivatives contracts, made with 884 counterparties (many of which we had never heard of). So we decided to close up shop. Though we were under no pressure and were operating in benign markets as we exited, it took us five years and more than $400 million in losses to largely complete the task. Upon leaving, our feelings about the business mirrored a line in a country song: '*I liked you better before I got to know you so well*.'" (Buffett (2009):17)

Buffett also described practices in housing finance as involving "*borrowers who shouldn't have borrowed being financed by lenders who shouldn't have lent.*" (Buffet (2009): 11) This was possible exactly because of securitization. While originators could pass off credit risks by selling the loans, final investors buying the rights to receive the transformed cash flows from these loans were largely unable to fully understand and analyze the things they bought, which were too complex. But there was one key actor with the power and the means to stop this development: the government. However, as discussed in the following chapter, it not only failed to stop the looming problems but made things even worse by various policies.

Chapter 4

The role of the government: the road to hell paved with good intentions again

"Over the past ten years, there has been a 'revolution in affordable lending' that has extended homeownership opportunities to historically underserved households. Fannie Mae and Freddie Mac have been a substantial part of this 'revolution in affordable lending'. During the mid-to-late 1990s, they added flexibility to their underwriting guidelines, introduced new low-downpayment products, and worked to expand the use of automated underwriting in evaluating the creditworthiness of loan applicants. HMDA data suggest that the industry and GSE initiatives are increasing the flow of credit to underserved borrowers. Between 1993 and 2003, conventional loans to low income and minority families increased at much faster rates than loans to upper-income and nonminority families."

"More liberal mortgage financing has contributed to the increase in demand for housing. During the 1990s, lenders have been encouraged by HUD and banking regulators to increase lending to low-income and minority households. The Community Reinvestment Act (CRA), Home Mortgage Disclosure Act (HMDA), government-sponsored enterprises (GSE) housing goals and fair lending laws have strongly encouraged mortgage brokers and lenders to market to low-income and minority borrowers. Sometimes these borrowers are higher risk, with blemished credit histories and high debt or simply little savings for a down payment. Lenders have responded with low down payment loan products and automated underwriting, which has allowed them to more carefully determine the risk of the loan."

Statements by HUD (Department of Housing and Urban Development) from 2004 and 2005
(Cited by Peter J. Wallison: *Dissenting Statement*. In: FCIC – Financial Crisis Inquiry Commission (2011): *The Financial Crisis Inquiry Report.* U.S. Government Printing Office, Washington D.C. pp. 488, 489.)

Prior to the crisis the various bodies of the US federal government did not prevent the American people from taking loans they could not afford or the banks and other financial institutions from risky lending and investing. The decreasing prudence of borrowers and lenders, loosening underwriting and lending practices, expanding securitization and increasing leverage and risk taking in the financial sector had been running for years without any serious government attempt (or even incentive) to stop them. Public policies not only failed to prevent the crisis but – on the contrary – they contributed to it. Various steps designed to achieve noble goals contributing to social welfare led to unintended consequences paving the way to the greatest economic disaster in decades. Government policies created an environment full of moral hazard which resembled a giant casino where – unlike in a normal gambling casino – the bets were guaranteed by the state, so the players never lost: profits were privatized and losses socialized.[35] Under these circumstances, it is quite natural that almost everybody gambled from Wall Street to Main Street, the various actors from households to large financial holdings took ever increasing risks as rational players. When "the music stopped playing" (house prices started to fall, triggering the crisis) the gambling was over, and as a consequence American tax-payers faced a mounting bill in the form of expanding public debt.

The government policies and failures which most contributed to the crisis can be grouped into three major points: (1) a housing policy which actively supported the origination and securitization of risky mortgage loans with explicit or implicit government guarantees or by other means; (2) a monetary policy which kept interest rates too low for too long aiming to help the economy to recover from the 2001 recession; and (3) failed regulation of the financial sector, which allowed banks and other actors of shadow banking to engage in risky activities and operate with rising, dangerously high leverage and minimal own equity, and rely on probable government help in case major problems occurred.

35 For more detailed picture of the incentives of gamblers (both householan economist Hans-Werner Sinn, chapters 4 and 5: Sinn (2010): *Casino Capitalism. How the Financial Crisis Came About and What Needs to be Done Now*. Oxford University Press, Oxford. The comparison of American housing finance to a casino was also borrowed from the same book.

Of course, these public policies were not designed to create a crisis, they followed noble but also popular goals like increasing the homeownership rate of American households (especially of those with lower incomes), ending the discrimination of certain neighborhoods in mortgage origination (the so-called red lining practices) or fostering economic growth and job creation. Paving the way to the crisis also had its roots in widespread beliefs shared by the majority of the public and/or the political elites, e.g. living in one's own house is an essential part of the American Dream; a strong financial sector is very important both for the well-being of citizens and for America's leading position in the world. To put it simply: what is good for Wall Street is also good for Main Street (similar to the saying years before: "What is good for General Motors is good for America"). One also has to acknowledge that most public policies were successful in achieving their declared goals (at least temporarily, prior to the crisis). Homeownership rates were continuously rising, reaching historic heights before 2005, the availability of mortgage loans dramatically increased in minority neighborhoods, the Federal Reserve's loose monetary policy helped the economy recover from the recession and the financial sector's share of American corporate profits and employment rose dramatically (together with its tax payments and campaign contributions to politicians), securing the USA's pre-eminent position in the financial world. However, the problem is the huge price that America (but also other countries of the world) has paid – and will continue to pay – for these successes. The final bill (of the crisis) for taxpayers was still unknown at the time of writing but it had certainly far exceeded the preceding benefits by the end of 2010. The other unfortunate character of development prior to the crisis was that while the benefits of ill-designed public policies were evident for everybody, only a few managed to find out the enormous looming risks of the same policies. There were even fewer who warned loudly about the possible problems, sounding the alarm bell, let alone decision makers who listened to them carefully. Basically, there was no major change in the public policies sharing the responsibility for the crisis before the disaster hit. In the following pages, we will try to elaborate the main government failures that contributed to the crisis starting with the most important one, the housing policy.

4.1 The government wants everybody in America to be a homeowner

"*We want everybody in America to own their own home*" president George W. Bush had said in October 2002 and he added in the next year that: "*It is in our national interest that more people own their home*" (cited by Ferguson (2008): 267). It was in the same year of 2003 when he signed the American Dream Downpayment Act, a measure designed to subsidize first-time house purchases among lower income groups (ibid.). There was nothing special in these statements, indeed Bush just echoed the widespread belief of the Washington political elite shared by most across the political spectrum and questioned by very few. His administration just followed the way housing policy had been working for decades: continuously increasing government interference, and manipulating the credit system and mortgage guarantees. While the United States are – rightly – considered one of the freest or most liberal market economies in the world, their housing policy is certainly an exception. As Lawrence J. White put it: *"It may be only a modest exaggeration to describe government policy toward housing as one where 'too much is never enough'"* (White (2004): 6).

The main policies prior to the crisis can be summarized as follows: [36]

- tax advantages: the exclusion of implicit income from housing by owner-occupiers for income tax purposes, while allowing the deduction of mortgage interest and local real estate taxes; the exemption of owner-occupied housing from capital gains taxation; accelerated depreciation on rental housing; and special tax cre dits, exemptions, and deductions;
- rent subsidization programs;
- direct gov ernment provision of rental housing ("public housing");
- favorable funding for thrifts and other depository institutions that focus on mortgage lending through the Federal Home Loan Bank system;
- federal deposit insurance (provided by the FDIC) for thrifts and for other depositories whose portfolios contain some residential mortgages;

36 Based on: White, Lawrence J. (2004): Fannie Mae, Freddie Mac, and Housing Finance. Why True Privatization Is Good Public Policy. CATO Policy Analysis No. 528, Cato Institute, Washington, D.C. p. 6.

- separate depository charters for savings institutions (thrifts) with mandates to invest in residential mortgages;
- mortgage insurance provided by FHA and VA, securitization of FHA and VA mortgages by Ginnie Mae;
- purchases of mortgages for portfolio holdings by Fannie Mae and Freddie Mac and securitization of conforming mortgages by Fannie Mae and Freddie Mac; and
- measures supporting higher homeownership rates for low or moderate income and minority households like the Community Reinvestment Act (CRA) or the so-called affordable housing goals set for GSEs.

The last three policies have done the most damage. Before turning to them it is important to devote a little attention to tax advantages. In the United States – unlike in most other developed countries – mortgage interest payments had always been tax deductible since the introduction of federal income tax in 1913. Similarly, the imputed rent from owning one's home was also free of tax. US households therefore had more incentive to keep the loan-to-value ratio high on an ongoing basis (Ellis (2008): 18). They also had this incentive because they could pay off other consumer credit with cash extracted from their homes, for example with home equity loans. Interest on all other consumer loans – car loans, credit cars, and consumer credit – was not deductible for federal tax purposes, so often households turned to home equity loans for purchases or loan repayments that would ordinarily be made with credit cards, auto loans, or ordinary consumer loans (Wallison (2008): 7). This also contributed to frequent mortgage refinancing and constantly high LTV ratios which in turn very soon resulted in widespread negative equity when home prices started to fall. However, these tax incentives contributed only modestly to the crisis compared to the government's involvement in mortgage origination, insurance, securitization and guarantying.

FHA mortgages were insured, funded and securitized by federal government agencies like the Federal Housing Administration and Ginnie Mae and thus were the direct obligation of the government (see the Glossary in the Annex and Text Box 1). At the time of their creation after the Great Depression, the required down payment for FHA insured mortgages was 20 percent, which was considered very low. However, by 2004 – after continuous lowering of the underwriting standards – the required down payment on

the FHA's most popular program had fallen to only 3 percent (White (2008): 5). Therefore the US federal government itself (by its agencies) was de facto giving risky mortgage loans with minimal or no down payment to borrowers with questionable creditworthiness. As already illustrated in Figure 4, FHA mortgages had above average delinquency (and also default) rates from the early 1990s – rates very high by international comparison – giving a leading role to the federal government in the industry-wide trend of lowering mortgage origination standards, which resulted in a wave of delinquencies and foreclosures. Pinto et al ((2011): 58) showed that historically foreclosure rates of FHA loans were rising after every reduction of minimal down payments (between 2000 and 2008 the share of FHA loans with LTV at 97 percent or more averaged 51 percent, 85 percent of the loans had an LTV equal or higher than 90 percent).

Table 7: **FHA as a Leader in Relaxing Mortgage Origination Standards** (development of FHA loan characteristics)

Year	Maximum LTV limit	Maximum loan term	Monthly payment*	Homeowner equity after five years (with no increase in house prices)	Mortgage payment--to-income ratio	Income needed to buy median-priced home*
1934	**80 %**	**20 years**	**$670**	**30 %**	Not available	Not available
1938	**90 %**	**25 years**	**$695**	**17 %**	Not available	Not available
1948	**90 %**	**30 years**	**$660**	**14 %**	17 % (average)	$26,600 income/ $44,600 home
1956	**95 %**	**30 years**	**$697**	**10 %**	Not available	Not available
1984	**97 %**	**30 years**	**$712**	**8 %**	38 % (maximum)	$23,000 income/ $80,000 home

* For comparison, all examples are based on the purchase of a $100,000 home at the maximum LTV and term with an interest rate of 8 percent except for the median-home-price calculation, which uses the applicable median home price (based on US Census Bureau data).

Source: **Pinto, Edward J. – Pollock, Alex J. and Wallison, Peter J. (2011):** *Taking the Government Out of Housing Finance: Principles for Reforming the Housing Finance Market*. American Enterprise Institute Policy White Paper, American Enterprise Institute for Public Policy Research, Washington D.C., p. 57.

Considering the modest market share of FHA loans, the government policy toward the mortgage originators and GSEs has done much more damage.

The Community Reinvestment Act enacted in 1977 (applicable only to federally insured depository institutions) was intended

to encourage depository institutions to lend to their local communities – including low and moderate income (LMI) neighborhoods – and thus help eliminate the so-called red-lining (discriminatory lending) practices which were considered to contribute to urban decline and the creation of slums.[37] At the beginning, the act was a relatively innocuous tool in the hand of regulators because of its vague mandate. It merely imposed reporting requirements on commercial banks regarding the extent to which they lent funds back into communities where they gathered deposits (White (2008): 5). The "community" itself was not defined, the act stated only that it was intended to "encourage" banks in lending, and regulators were mandated only to "consider" whether an insured bank was serving the needs of the community (Wallison (2008): 2). However, federal regulatory agencies examined banking institutions for CRA compliance (giving them CRA ratings and preparing written reports), and took this information into consideration when approving applications for new bank branches or mergers or acquisitions. These ratings became really important and valuable when a 1989 amendment made them partially public and five years later the restrictions on interstate banking were lifted (the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994, see Text Box 1), while CRA ratings were listed among the considerations for regulators to allow interstate branching, mergers and acquisitions (FCIC (2011): 72 – 74, Wallison (2011): 525, 553). The evaluation of lending practices (and thus the creation of CRA ratings) was possible because of the Home Mortgage Disclosure Act (HMDA) passed by Congress in 1975, which required that mortgage lenders provide detailed in-

37 Financial institutions accepted deposits from households and small businesses in lower income neighborhoods many times, but failed to lend and invest in the same neighborhoods, even to borrowers who otherwise would be considered qualified. The banks had given negative credit ratings to whole urban areas and divided the cities on a map (based on "residential security maps" created by the Home Owners' Loan Corporation (HOLC) for the FHA in 1930s), marking the low creditworthy neighborhoods with a red color (the reason why this practice was named "red-lining"). This hidden financial discrimination was a part of the overall segregation because the cities divided in theory by credit-ratings were in practice divided by race, cutting off the black population (considered not creditworthy as a whole) from mortgages or forcing them to accept worse conditions (Ferguson (2008): 249 – 250).

formation about mortgage applications. In 1991 the HMDA data was expanded, allowing for the comparison of rejection rates by race (Liebowitz (2008): 6). Just a year later, in 1992, two authors from the Boston Federal Reserve Bank published a study of discrimination in residential mortgage lending which stated that instead of overt discrimination more subtle forms of this practice existed, resulting in better treatment by loan officers for whites than members of minorities who were denied mortgages at higher rates (Wallison (2008): 2). Although the methodology of the study has since been seriously questioned[38], its publication led to powerful media and political attention, so nobody could stop the political machinery from making substantial changes in the CRA.

Based on the Boston Fed's study, in 1995, under the Clinton administration another new amendment was passed concerning the CRA, which became a turning point in the way the act was used by regulators: it was now necessary for banks to show that they really made the requisite loans to LMI communities to get a favorable rating (Wallison (2008): 3). In addition, groups of residents from disadvantaged communities or organizations supporting them like ACORN (Association of Community Organizations for Reform Now) or the NCRC (National Community Reinvestment Coalition) were allowed to start class action suits against the banks at courts

38 The Boston Fed collected data on approximately three thousand mortgages. Liebowitz provided a quick summary of the data problems: (a) the loan data that the Boston Fed created had information that implied, if it were to be believed, that hundreds of loans had interest rates that were much too high or much too low (about fifty loans had negative interest rates according to the data); (b) over five hundred applications could not be matched to the original HMDA data upon which the Boston Fed data was supposedly based; (c) forty-four loans were supposedly rejected by the lender but then sold in the secondary market, which is impossible; (d) two separate measures of income differed by more than 50 percent for over fifty observations; (e) over five hundred loans that should have needed mortgage insurance to be approved were approved even though there was no record of mortgage insurance; and (f) several mortgages were supposedly approved to individuals with a net worth in the negative millions of dollars. (Liebowitz, Stan J. (2008): *Anatomy of a Train Wreck. Causes of the Mortgage Meltdown*. Independent Policy Report, The Independent Institute, Oakland, CA, pp. 6 – 7.)

if they proved that the banks granted fewer loans in one particular neighborhood than elsewhere; the same organizations even gained co-determination rights in awarding mortgage loans (Sinn (2010): 106). From 1993, officials at the Department of Housing and Urban Development also began bringing legal actions against mortgage bankers that declined a higher percentage of minority applicants than white applicants (White (2008): 6). Even the current president, Barack Obama used to participate in similar anti-discrimination trials as a lawyer and he also worked for ACORN.[39] The new CRA rules and the systematic pressure from regulators and advocacy groups contributed to the changes in depository institutions' behavior. The banks started to distribute mortgages to LMI borrowers previously considered noncreditworthy (sometimes joining into partnerships with community groups to do so) or – using a newly authorized option – purchased "CRA mortgage-backed securities" to boost their CRA rating (ibid.). While the formulation of the CRA was rather confusing, the intention behind the Clinton amendment was quite clear. The act stated that depository institutions "*are permitted and encouraged to develop and apply flexible underwriting standards for loans that benefit low and moderate income geographies or individuals, only if consistent with safe and sound operations*"[40]. Here the "safe and sound operations" are in clear conflict with "flexible underwriting standards", which in practice meant the relaxation of lending standards, i.e. lowering down payments and not insisting on income, a steady job, or unblemished credit. However, the intention of the Clinton administration was quite clear and it could be well illustrated by the following statement of Attorney General Janet Reno in January 1994: "*We will tackle lending discrimination wherever and in whatever form it appears. No loan is exempt, no bank is immune. For those who thumb their nose at us, I promise vigorous enforcement*" (cited in Wallison (2008): 4). Notwithstanding these clear intentions, it is still problematic to assess the real role that the CRA played in the degradation of mortgage lending standards. As is clear from the previous chapter, non-depository financial institutions (not subject to CRA rules) flooded the market with risky subprime and Alt-A loans anyway. There is no reason to believe that they would have behaved differently in the absence of the CRA. However, it is impor-

39 Obama successfully represented the prosecution in a 1995 case *Buycks-Roberson v Citibank*, accusing Citibank of having systematically rejected credit applications for ethnic minorities (Sinn (2010): 106).

40 12 CFR 25.21 d. (CFR – Code of Federal Regulations)

tant to note that in the case of depository institutions the initiative to relax lending standards came from the regulators and not from the banks. Normally, one would expect that the regulators would try to prevent the banks from loosening underwriting criteria; in the US it was the other way around. The federal government was pioneering the way of the degradation of mortgage lending standards with its FHA loans and CRA requirements. Various institutions openly advocated this, proposing and celebrating the new underwriting standards. The Boston Fed just a few months after the publication of its famous 1992 study on discrimination published a manual on non-discriminatory mortgage lending:

"The Federal Reserve Bank of Boston wants to be helpful to lenders as they work to close the mortgage gap (higher rejection rate for minorities). For this publication, we have gathered recommendations on "best practice" from lending institutions and consumer groups... Failure to comply with the Equal Credit Opportunity Act or Regulation B can subject a financial institution to civil liability for actual and punitive damages in individual or class actions. Liability for punitive damages can be as much as $10,000 in individual actions and the lesser of $500,000 or 1 percent of the creditor's net worth in class actions... Management should be directed to review existing underwriting standards and practices to ensure that they are valid predictors of risk. Special care should be taken to ensure that standards are appropriate to the economic culture of urban, lower-income, and nontraditional consumers... Lack of credit history should not be seen as a negative factor. Certain cultures encourage people to "pay as you go" and avoid debt. Willingness to pay debt promptly can be determined through review of utility, rent, telephone, insurance, and medical bill payments. In reviewing past credit problems, lenders should be willing to consider extenuating circumstances. For lower-income applicants in particular, unforeseen expenses can have a disproportionate effect on an otherwise positive credit record. In these instances, paying off past bad debts or establishing a regular repayment schedule with creditors may demonstrate a willingness and ability to resolve debts. Successful participation in credit counseling or buyer education programs is another way that applicants can demonstrate an ability to manage their debts responsibly... While it is important to ensure that the borrower is not assuming an unreasonable level of debt, it should be noted that the secondary market is willing to consider ratios above the standard 28/36 (share of income that can be devoted to mortgage payments, gross or net)... Accumulating enough

savings to cover the various costs associated with a mortgage loan is often a significant barrier to home ownership by lower-income applicants. Lenders may wish to allow gifts, grants, or loans from relatives, nonprofit organizations, or municipal agencies to cover part of these costs. Cash–on–hand could also be an acceptable means of payment if borrowers can document its source and demonstrate that they normally pay their bills in cash... In addition to primary employment income, Fannie Mae and Freddie Mac will accept the following as valid income sources: overtime and part–time work, second jobs (including seasonal work), retirement and Social Security income, alimony, child support, Veterans Administration (VA) benefits, welfare payments, and unemployment benefits." (cited in Liebowitz (2008): 7 – 10)

The Fannie Mae Foundation in its 2000 report celebrated Countrywide Financial for using innovative underwriting practices:

"Countrywide tends to follow the most flexible underwriting criteria permitted under GSE and FHA guidelines. Because Fannie Mae and Freddie Mac tend to give their best lenders access to the most flexible underwriting criteria, Countrywide benefits from its status as one of the largest originators of mortgage loans and one of the largest participants in the GSE programs. When necessary – in cases where applicants have no established credit history, for example – Countrywide uses nontraditional credit, a practice now accepted by the GSEs." (cited by Liebowitz (2008): 10)

These "flexible underwriting criteria" resulted in huge losses for Countrywide as early as in 2007; the mortgage lender became one of the first casualties of the crisis (it was acquired by Bank of America in January 2008 after its share prices plunged 48 %).

Many mortgage financing firms not covered by the CRA also started to behave according to the act voluntarily adopting "best practices agreements" proposed by the HUD. In 1994 the Mortgage Bankers Association (MBA) – a group of mortgage financing firms not otherwise regulated by the federal government and not subject to the HUD's legal authority (not subject to CRA rules either) agreed to join a HUD program called the "Best Practices Initiative" (Wal-

lison (2011): 523).[41] The first individual agreement under the umbrella of this initiative was signed with Countrywide Funding Corp., the nation's largest mortgage originator and servicer which originated $789 billion in loans over 2001 – 2007 to fulfill its $1 trillion HUD "Best Practices" commitment (Pinto (2010): 166).

In 2007, the umbrella organization for many low-income or community "advocacy groups," the National Community Reinvestment Coalition, published a report entitled "CRA Commitments" which stated that "*(s)ince the passage of CRA in 1977, lenders and community organizations have signed over 446 CRA agreements totaling more than $4.5 trillion in reinvestment dollars flowing to minority and lower income neighborhoods. Lenders and community groups will often sign these agreements when a lender has submitted an application to merge with another institution or expand its services*" (Wallison (2011): 526).

The problems elaborated above appear to be still minor compared to the giant losses caused by the two GSEs, Fannie Mae and Freddie Mac. The policies that allowed the hyperexpansion and the risky business strategy (namely operating with very high leverage) of the two behemoths, as well as those which forced them to purchase, securitize and guarantee more and more risky mortgages and acquire subprime and Alt-A MBSs constituted the single biggest government failure paving the way to the crisis. Prior to their de facto nationalization in September 2008 thanks to their rapid growth from the 1970s, Fannie and Freddie became the two largest financial corporations of America and the world, holding or guarantying (through mortgage-backed securities) some $5.5 trillion in mortgages, 45 percent of the $12 trillion US residential mortgage market (in comparison, all the commercial banks and savings institutions in America were holding $3 trillion in residential real

41 The voluntary character of the Mortgage Bankers Associations commitment is questioned by some observers who argue that the MBA signed up to avoid an effort by the HUD to cover mortgage bankers under the Community Reinvestment Act, which up to that point had only applied to government-insured banks (Wallison (2011): 523).

estate assets).[42] The two GSEs Fannie Mae and Freddie Mac were not ordinary corporations; they differed from all other American (private) companies in many ways summarized in Text Box 2 (see also the Glossary in the Annex and Text Box 1).

It is quite clear from Text Box 2 that while the regulation of the two giant GSEs was rather lax (continuously increasing loan limits and relaxed underwriting standards for purchased mortgages, with very high leverage allowed) the advantages ensured them access to cheap funding. Investors were willing to lend them at interest rates just slightly above those on Treasury securities (considered the safest, basically risk-free) because Fannie and Freddie provided a guarantee for their "agency" MBSs, which also had implicit government backing. "*Such privileges led investors and creditors to believe that the government implicitly guaranteed the GSEs' mortgage-backed securities and debt and that GSE securities were therefore almost as safe as Treasury bills. As a result, investors accepted very low returns on GSE-guaranteed mortgage-backed securities and GSE debt obligations*" (FCIC (2011): 39). It was clear for the investors that if Fannie and Freddie became "too big to fail", i.e. should any major problems occur, the US government was not going to let collapse the two largest financial firms in the country which control almost half of American residential mortgage finance. As it later turned out (on 6 September 2008 the government placed Fannie Mae and Freddie Mac into conservatorship), these assumptions were exactly right.

42 At the end of September 2008, Fannie Mae had outstanding $897 billion in assets (holding mortgages and MBSs) and $2.3 trillion in MBS (guaranteeing securitized mortgages). By comparison, Freddie Mac, the second-largest GSE, had $804 billion in assets and $1.46 trillion in MBS outstanding (Barth et al (2009): 175).

Text Box 2: **The Special Status of Fannie Mae and Freddie Mac**

Advantages	**Disadvantages**
They were created by Congress and thus hold special federal charters (unlike virtually all other corporations, which hold charters granted by a state, often Delaware).	Their special charters restricted them to residential mortgage finance.
	They were specifically forbidden to engage in mortgage origination.
The president could appoint 5 of the 18 board members of each company.	They were subject to a maximum size of mortgage (linked to an annual index of housing prices) that they could finance; for 2004 that limit for a single-family home was $333,700, by 2007 it had grown to $417,000.
Each company had a potential line of credit with the U.S. Treasury for up to $2.25 billion and an implicit guarantee on their debt by the federal government.	
Both companies were exempt from state and local income taxes.	The mortgages that they financed must have at least a 20 percent down payment (i.e., a maximum loan-to-value ratio of 80 percent) or a credit enhancement (such as mortgage insurance), although these standards were later relaxed.
They could use the Federal Reserve as their fiscal agent.	
Their debt was eligible for use as collateral for public deposits, for purchase by the Fed in open-market operations, and for unlimited investment by commercial banks and S&Ls. This gave the GSEs access to cheap funds (paying interest just slightly over treasury bonds) but also motivated the banks to keep a disproportional part of their assets in MBS issued by Fannie and Freddie.	They were subject to safety-and-soundness regulation–for example, minimum capital requirements and annual examinations–by the Office of Federal Housing Enterprise Oversight. However, these regulation and requirements were rather lax (minimum capital equal to 2.5 percent of their on-balance sheet assets plus 0.45 percent of their outstanding off-balance sheet guarantees), allowing the GSEs to operate with very high leverage, resulting in a high return on equity for shareholders.
Their securities were exempt from the Securities and Exchange Commission's registration and reporting requirements and fees	They were subject to "mission oversight" by HUD, which approved specific housing finance programs and set social housing targets for the two companies, like the affordable housing goals designed to support mortgage origination for low and medium income households (described below and in Table 8).
Their securities were explicitly government securities under the Securities Exchange Act of 1934.	
Their securities were exempt from the provisions of many state investor protection laws.	

Source: **White, Lawrence J. (2004):** *Fannie Mae, Freddie Mac, and Housing Finance. Why True Privatization Is Good Public Policy.* CATO Policy Analysis No. 528, Cato Institute, Washington, D.C. pp. 4 - 5.

Originally, the two GSE's mission was to purchase and securitize "prime" (or "conforming") mortgages that were subject to sound underwriting criteria (a reasonable LTV ratio, FICO score and credit enhancement) but the changing mood of Washington politics resulted in rising political pressure to put the sound criteria aside. These pressures were very much in line with the Clinton administration's general approach toward housing demonstrated in the 1994 National Homeownership Strategy. Tad DeHaven cites and comments on the strategy as follows:

"'*For many potential homebuyers, the lack of cash available to accumulate the required downpayment and closing costs is the major impediment to purchasing a home. Other households do not have sufficient available income to make the monthly payments on mortgages financed at market interest rates for standard loan terms. Financing strategies, fueled by the creativity and resources of the private and public sectors, should address both of these financial barriers to homeownership*.' The thrust is clear: if people don't have "cash" or "income," the government will help them get a house anyway. In the political drive to increase the home ownership rate, old-fashioned ideas such as individual responsibility and the riskiness of real estate investment were thrown by the wayside. Apparently embarrassed by this 1994 strategy document, HUD removed it from its website after the housing bubble burst in recent years." (DeHaven (2009): 6)

The 1992 Federal Housing Enterprises Financial Soundness and Safety Act authorized the secretary of the Department of Housing and Urban Development (HUD) to set "affordable housing goals" for the two GSEs, "*involving a reasonable economic return that may be less than the return earned on other activities*" (FCIC (2011): 41). The Act established three housing goals (ibid.):

1. The Low- and Moderate-Income Housing Goal: loans to borrowers with incomes at or below the median income for the market area in which they live;
2. The Special Affordable Goal: loans to very low-income borrowers (those with incomes at or below 60 percent of the area median income), or to low-income borrowers living in low-income areas (borrowers with incomes at or below 80 percent of the area median income, living in census tracts in which the median income of households is at or below 80 percent of the area median income); and
3. The Underserved Areas Goal: loans to borrowers living in low-income census tracts (tracts in which the median income of residents is at or below 90 percent of the area median income) or high-minority tracts (tracts in which minorities comprise at least 30 percent of residents, and the median income of residents in the tract does not exceed 120 percent of the area median income).

Table 8: **GSE Affordable Housing Goals since 1993** (share of mortgage purchases in %)

	1993 – 1995	1996	1997 – 2000	2001 – 2004	2005	2006	2007	2008
Low and Moderate Income Goal	30	40	42	50	52	53	55	56
Special Affordable Goal	NA*	12	14	20	22	23	25	27
Underserved Areas Goal**	30	21	24	31	37	38	38	39

Notes: * NA – Not Applicable: goals set in dollar amounts for each GSE rather than percentages.
** Underserved Areas goal determined on the basis of 1990 Census tract geography from 1993 through 2004, and on the basis of 2000 Census tract geography from 2005 – 2008.

Source: **Pinto, Edward J. (2010):** *Government Housing Policies in the Lead- up to the Financial Crisis: A Forensic Study*. Discussion Draft 8/14/2010, American Enterprise Institute for Public Policy Research, Washington D.C., p. 86 based on Federal Housing Finance Agency data.

The GSEs mostly met or exceeded the continuously rising goals (shown in Table 8) until 2008 by two means (Pinto (2010): 86). First, they purchased an increasing number of subprime and alt-A loans, which otherwise would not have qualified for GSE standards because of a high loan-to-value ratio and/or low FICO scores. For example, from 2005 to 2007, Fannie and Freddie bought approximately $1 trillion in subprime and Alt-A loans, amounting to about 40 percent of their mortgage purchases during that period (Wallison (2008): 5). Second, the GSEs started to buy a rising amount of private-label MBS[43], so not accidentally did they end up as the two largest holders of these securities (already illustrated in Table 6). The problem of course was that starting from 2007 the non-prime mortgage loans and later also the securities backed by these loans (which soon earned the name "toxic assets") were defaulting at unprecedented rates, resulting in colossal losses for Fannie and Freddie. Considering their very high leverage, the mounting losses threatened to quickly eat up the whole equity capital – without government help

43 Starting in 2001 for Freddie and 2002 for Fannie, the GSEs – particularly Freddie – became buyers of private-label mortgage backed securities. While private investors always bought the most, the GSEs purchased 10,5 % of the private-issued subprime mortgage backed securities in 2001. The share peaked at 40 % in 2004 and then fell back to 28 % in 2008. The share for Alt-A mortgage–backed securities was always lower. (FCIC (2011): 123 – 124) In 2007 Fannie Mae owned $94,8 billion in private-label MBS, Freddie Mac in the same time held $218,9 billion, approximately two thirds of these portfolios were made out of subprime and Alt-A PMBS (Barth et al (2009): 180).

there was no chance to survive. The GSEs operated with such a high leverage (or such a small equity-to-asset ratio) that their losses by 1 October 2009 represented 427.7 percent of the 2007 equity in the case of Freddie Mac, and 309.9 percent in the case of Fannie Mae – the highest losses relative to equity among all major American and European financial institutions (Sinn (2010): 175). From 1 January 2008, through the third quarter of 2010, the two GSEs lost $229 billion; the FHFA has estimated that costs through 2013 will range from $221 billion to $363 billion. The Congressional Budget Office has projected that the economic cost of the GSEs' downfall, including the total financial cost of government support as well as actual dollar outlays, could reach $389 billion by 2019 (FCIC (2011): 322).

Fannie and Freddie were the most important players in federal housing policy, which prior to the crisis resulted in a situation where more than half of all mortgages and more than two thirds of risky mortgages were somehow related to the federal government (they were insured by the FHA or securitized by the Ginnie Mae and the GSEs, bought by the GSE as mortgages or MBSs or subject to CRA rules or the HUD's Best Practices commitments). As estimated by Pinto ((2010): 29) as of 30 June 2008 over 70 % (19.25 million loans) of the 26.7 million Non-Traditional Mortgages (NTMs) with weak or high risk characteristics[44] were owned or guaranteed by (a) Fannie Mae and Freddie Mac (11.9 million), (b) the Federal Housing Administration and other federal agencies (4.8 million), (c) Federal Home Loan Bank (FHLB) investments in Alt-A and Subprime Private MBS (0.3 million) or (d) banks and other lenders originating loans pursuant to CRA requirements and the HUD's Best Practices program (2.2 million, net of CRA loans already accounted for in (a) and (b)).

The heavy involvement of the government was another unique feature of American housing finance. Most other developed countries had no mortgage insurance provided by a state institution (such as FHA insurance) and no government mortgage secu-

44 NTM loans with weak or high risk characteristics are defined as either subprime or Alt-A ("alternative to agency") loans. By number at the end of June 2008, 49 % of the estimated 55 million first mortgages were subprime or Alt-A (26.7 million of 55 million); in dollars, the same 49 % of the estimated $9.42 trillion in outstanding first lien mortgages were subprime or Alt-A ($4.622 trillion/$9.42 trillion) (Pinto (2011): 165; Appendix A: 5 – 6).

ritization or guarantees (like those provided by Ginnie Mae), or government sponsored enterprises (like Fannie Mae and Freddie Mac). Even in those countries which had similar institutions (for example, Canada and Japan had government guarantee programs, Canada and The Netherlands had government-backed mortgage insurance programs and South Korea had a GSE – "Korean Housing Finance Corp."), their market share was significantly lower than in the US (Lea (2010): 14). When the crisis erupted, about half of American mortgages were held or guaranteed by the two GSEs and Ginnie Mae. Considering the de facto nationalization of Fannie Mae and Freddie Mac in September 2008, the rapid evaporation of private-label securitization in the same year and the very high default rates of non-prime loans as well as high refinancing activity (fuelled by low interest rates and financed by the GSE through MBS issuance which are now the direct obligation of the federal government) – it is not an exaggeration to state that now American housing finance is mostly socialized. The vast majority of the outstanding mortgages has been securitized and explicitly guaranteed by the government. If other sectors of the American economy are like housing finance, the United States will be – rightly – considered a socialist country: the People's Republic of America. It is astonishing that the champions of the free market ended up like this. We can also draw a lesson from this: regardless of the fact that the American politicians tried to subsidize housing indirectly (to avoid its dismissal by the population, which is usually very sensitive to rising state expenditure), the final bill for housing policies still ended up on the shoulders of taxpayers.

4.2 The Fed kept interest rates too low for too long

Beside the federal government, there was one other actor with the means to stop or at least lessen the credit boom and the development of the housing bubble: America's central bank, the Federal Reserve (Fed). However, its behavior resembles that of the government: instead of stopping the boom, it rather fuelled it with monetary expansion and cheap credit (low interest rates). Partially, this was a consequence of the general economic orthodoxy, i.e. that central banks were attempting to control consumer price inflation but not asset price inflation. This is an important paradox of our age as central banks are focusing on the management of inherently stable goods markets (controlling the prices of goods) while they mostly ignore inherently unstable capital markets and let the credit booms and asset price bubbles develop (Cooper (2008): 140, 163 – 164). Even if central banks react, they do it asymmetrically: during the credit expansion and asset price boom their response was weak and delayed, but during the contraction phase it was violent and early (ibid. 138). The usual arguments against monetary intervention are summarized by the IMF as follows: "*The difficulties of identifying bubbles in asset prices and the uncertainty over the impact of monetary policy on asset prices are the main arguments against responding to asset price changes over and above the response warranted by their implications for inflation and output*" (IMF (2008): 122.).

Former Fed chairman Alan Greenspan during his years in office (1987 – 2006) experienced almost two complete cycles of the buildup and burst of big asset price bubbles: the dotcom boom and the housing boom. The Fed reacted to both cycles asymmetrically, as presented above: during the boom it did almost nothing to stop them, during the bust it tried to save the economy with drastic cuts in interest rates and massive liquidity injections. In spite of this experience, Greenspan is still skeptical about the possibilities of central banks to preemptively prick asset price bubbles before they reach dangerous levels posing a systemic risk to the economy. The former Fed chairman is "*increasingly persuaded that governments and central banks could not have importantly altered the course of the boom either*" (Greenspan (2008): 523). To do so, they would have had to induce a degree of economic contraction that electorates in modern democracies would hardly tolerate, espe-

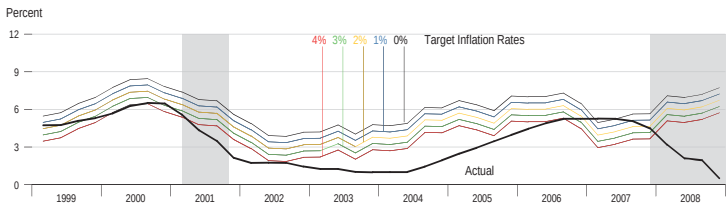
cially when it is supposed to combat a prospective problem that might not even materialize (ibid.). The other problem is to find out the right time to intervene, to know when exactly asset prices reached too high levels (this is in line with the observation of the IMF). As Greenspan noted:

"In late 1996, after the Dow Jones Industrial Average first topped 6500, I'd suggested that stock markets were in the grip of irrational exuberance. The crash finally came – but not until four years later, after the Dow had risen another 80 percent. Similarly in November 2002, after the acceleration in home-price increases had become eye-catching, I noted to my colleagues on the Federal Open Market Committee that the housing boom was sure to end. I was using Fedspeak, but my concern was clear: '... it is hard to escape the conclusion that...our extraordinary housing boom and its carryover into very large extractions of equity, financed by very large increases in mortgage debt, cannot continue indefinitely into the future.' Again, the bust took years to arrive. Thus when last year's crisis arose, its suddenness was a shock to the investment community (and me), but the fact of it was no surprise." (Greenspan (2008): 508)

However, following this logic means that asset prices would never be high enough to provoke a central bank intervention. On the other hand, any major fall in these prices immediately leads to massive monetary stimulus. This intervention then starts a new credit cycle, fuelling a new asset price bubble. This is exactly what happened after the burst of the dotcom bubble (a dramatic fall in stock prices, mostly in the technological sector), when the Fed reacted with monetary loosening to combat the 2001 recession. As soon as in 2002 and 2003 Greenspan already acknowledged that the recession was much milder than one could expect considering the long history of economic cycles and the major reason for this were technologic and financial innovations including the securitization of mortgages (Fleckenstein – Sheehan (2009): 111). He praised the attractive mortgages which allowed households to refinance and extract equity from their houses and use this money for construction and consumption (ibid. 112). This is also in line with the observation by Ben Bernanke presented at the end of the first chapter: in sharp contrast to all recessions in the previous decades when construction contributed to GDP decline, during the 2001 recession residential investment *boosted* the GDP growth (Bernanke (2007): 7). Low interest rates played a key role in

this development. According to IMF staff calculations, "*The increase in house prices and residential investment in the United States over the past six years* [2001 to 2006] *would have been much more contained had short-term interest rates remained unchanged*" (IMF (2008): 123.). The Fed radically decreased its target for the federal funds interest rate from 6.25 to 1.75 percent between the beginning and the end of 2001 and continued to cut the rate until mid-2003, when it reached a record low of 1 percent and stayed there for a year (White (2008): 3). By doing this, the Fed evidently ignored both the so-called Taylor Rule[45] (on inflation targeting) and actual inflation (Taylor (2009): 4 – 5). As Figure 7 from the St. Louis Fed illustrates, from 2001 to the end of 2006 the Federal Reserve pushed interest rates below the estimated rate that would have been consistent with targeting a 2 % inflation rate (ibid.).

Figure 7: **Federal Funds Rate and Inflation Targets**



Source: **Federal Reserve Bank of St. Louis (2009):** *Monetary Trends (April 2009),* p. 10.

45 The so-called Taylor Rule – a formula devised by economist John Taylor of Stanford University – provides a now standard method of estimating what federal funds rate would be consistent, conditional on current inflation and real income, with keeping the inflation rate to a chosen target rate – 0 to 4 percent in Figure 7 created by the St. Louis Fed (White (2008): 3). To be precise, the Taylor rule says (written down with algebra): $rT = \varpi + r^* + \lambda 1\ (\varpi - \varpi^*) + \lambda 2\ (GAP)$ with rT being the Taylor interest rate, ϖ the rate of inflation as measured by core CPI, ϖ^* the desired rate of inflation, r^* the assumed real "neutral" rate, and GAP the output gap (it measures how far GDP is from its normal trend level). $\lambda 1$ and $\lambda 2$ are the weights given to, respectively, inflation and output stabilization, with the constraint that they should add up to one. (For simplicity, and as widely adopted in the literature, equal weights on output and inflation stabilization are assumed here, *i.e.* $\lambda 1 = \lambda 2 = 0.5$.) (Ahrend et al (2008): 8.)

The federal funds rates were cut so aggressively that they were below actual inflation for two and a half years, meaning that real interest rates were negative. This by nature encourages borrowing (because borrowers in real terms pay back less than they actually borrowed) and discourages savings. Thus, it is not accidental that when interest rates reached record low levels, America experienced a boom in mortgage lending (illustrated in Figure 3) and historically low saving rates for households which fell to almost zero. The monetary expansion could also be demonstrated by rising money supply: the M2 monetary aggregate[46] was rising around 5 percent a year between 2001 and 2008, but in 2001 its growth was above 10 percent and it remained above 7 percent till 2003 (Federal Reserve Bank of St. Louis (2009): 4). The Fed not only ignored the increasing housing bubble but even the dangers of inflation, just to drag the American economy out from a recession (which was mostly a consequence of a previous asset price bubble on the stock markets). The Fed's expansionary monetary policy bears a great chunk of responsibility for the creation of conditions which led to booming mortgage lending and in this way it shares responsibility for the crisis. An international comparison shows that countries that experienced similar deviations from the Taylor rule also tended to have a housing bubble. Ahern et al. ((2008): 5) found strong evidence "*that periods when short-term interest rates have been persistently and significantly below what Taylor rules would prescribe are correlated with increases in asset prices, especially as regards housing.*" This is especially true within the monetary union in Europe where (because of persistent differences in inflation rates between the member states) interest rates consistent with the state of the euro area as a whole were persistently and significantly below what a "country-focused" Taylor rule would have suggested for higher inflation countries. The result

46 The M2 monetary aggregate equals M1 plus savings deposits (including money market deposit accounts) and small-denomination (under $100,000) time deposits issued by financial institutions and shares in retail money market mutual funds (funds with initial investments under $50,000) net of retirement accounts. M1 is the sum of currency held outside the vaults of depository institutions, Federal Reserve Banks and the U.S. Treasury, travelers checks, and demand and other checkable deposits issued by financial institutions (except demand deposits due to the Treasury and depository institutions), minus cash items in the process of collection and the Federal Reserve float (Federal Reserve Bank of St. Louis (2009): 19).

was that most of these countries (especially Spain and Ireland) experienced particularly strong housing and construction booms and house price increases (ibid. 15 – 16).

The monetary expansion alone – however strong it was – probably would not have been enough to drag the American economy out of the 2001 recession. However, it was accompanied by a massive fiscal stimulus under the Bush government. The cyclically adjusted financial balance of the US government (according to IMF calculations) shifted from a budget surplus of 1.6 percent of GDP in 2000 to a deficit of 4.6 percent in 2003, before improving to a deficit of 2.7 percent in 2006 (Wolf (2009): 99 – 100). Needless to say, the vast majority of this expansionary fiscal policy happened in the years of economic growth – contrary to any theoretical suggestions. Unfortunately this behavior – i.e. producing fiscal deficits during the years of economic growth – became commonplace in the Western world during the last decades, having surpluses or at least a balanced budget even during the "good years" was the exception, not the rule. In this respect, the behavior of the Bush government was business as usual and nothing extraordinary. The third source behind the recovery and the housing bubble between 2001 and 2007 was the massive rising influx of foreign capital into the American economy (discussed below in the fifth chapter).

4.3 Too lax regulation, too high leverage and too many "too big to fail" firms

The Fed not only contributed to the development of huge asset price bubbles but also failed in its financial oversight mission (i.e. it was not able to control the financial institutions and prevent the degradation of lending standards), but in this regard its responsibility is rather limited, considering the nature of financial markets regulation in America. Most other developed countries had much more centralized financial oversight prior to the crisis, concentrated in one or two major regulatory institutions (often placed within the central banks), the US – on the contrary – had a fragmented regulatory structure with many institutions as a result of historic development. De Michelis explains why this fragmented

structure was ill-prepared for new challenges, especially for addressing systemic risk endangering the whole financial sector:

"The current regulatory structure of US financial markets is based on the principle of 'functional' regulation, which maintains separate regulatory agencies across segregated functional lines of financial services, such as banking, insurance, securities, and futures. This combination of 'expert' regulators, each responsible for overseeing a specific function, was supposed to promote the resilience and the stability of the system. In practice, however... the system is highly fragmented, with a complicated web of multiple federal and states statutes and agencies. While the functional system might have served the United States well in the past, this fragmented system with a plethora of specialized agencies is no longer well suited to supervising financial institutions that often and increasingly operate across the traditional sectoral boundaries. No single regulator has all of the information to monitor systemic risk or the authority to take coordinated action throughout the financial system. Furthermore, competition across regulators has increasingly become a costly model in terms of efficiency and effectiveness, resulting instead in duplication and inter-agency disputes, lowering accountability and allowing regulatory arbitrage." (De Michelis (2009): 34)

Text Box 3 summarizes the structure of regulatory oversight of financial markets in the United States at the time when the crisis erupted.

Text Box 3: **The Fragmented Regulatory Structure of US Financial Markets**

Depository institutions: these include all commercial and savings banks. All depository institutions need a basic license to operate, the so-called "charter", and the type of charter largely determines the primary regulator and the regulatory regime governing its operations. A noteworthy feature of the US system is that charters can be obtained at either the federal or state level.	
Fed or FRS	**Federal Reserve System** – oversees state-chartered banks and trust companies that belong to the Federal Reserve System, bank holding companies (including financial holding companies), and US branches and agencies of foreign banks. In addition, the Federal Reserve possesses general consumer protection authority over all depository institutions at the federal level. To protect consumers, Congress over the years has enacted several important statutes applicable to all lenders, including: the Truth in Lending Act (TILA), which requires that credit terms for both credit card and mortgage transactions be clearly disclosed so consumers can compare credit terms more readily and knowledgeably; and the Home Ownership and Equity Protection Act (HOEPA), which amended TILA to prohibit unfair or deceptive acts of mortgage lending. The Federal Reserve has sole authority to write regulations implementing TILA and HOEPA. These rules issued by the Federal Reserve apply to all mortgage lenders but are enforced by the various bank regulators depending on the type of depository institution.
FDIC	**Federal Deposit Insurance Corporation** – regulates state-chartered banks that do not belong to the Federal Reserve System. The FDIC also administers the federal deposit insurance system and thus has backup regulatory and examination authority over all depository institutions that it insures. In addition, the FDIC plays a key role in administering the process of resolution of failed institutions.
OCC	**Office of the Comptroller of the Currency** – regulates all federally chartered "national" ("N.A.") banks, and also supervises the federal branches and agencies of foreign banks.
NCUA	**National Credit Union Administration** – regulates federally charted credit unions.
OTS	**Office of Thrift Supervision** – oversees federal savings and loans and federal savings banks.
State level	**State Banking Departments** (50 states and the District of Columbia) – regulate state chartered banks.
Securities and futures markets: the principal category of intermediaries in the securities markets are the brokers and the dealers. Essentially, a broker is a firm or individual who acts as an intermediary between buyers and sellers of securities, usually charging a commission for these services. A dealer is a firm or person who is in the business of buying and selling securities for her own account, either directly or through a broker. Many firms operate as both brokers and dealers.	
SEC	**Securities and Exchange Commission** – regulates the purchase and sale of "securities" at the national/federal level. In addition, in 2004, the SEC implemented a voluntary program to regulate certain major US securities firms on a consolidated or group-wide basis. The SEC generally therefore examines all registered broker-dealers associated with Consolidated Supervised Entities (CSEs), material affiliates of a CSE, as well as the ultimate holding company. Under the program, the CSEs are required to maintain a system of internal controls, adequate capital, and sufficient liquidity to ensure that they can meet any obligatory cash commitments, even in a stressed environment. However, the SEC does not examine a CSE ultimate holding company or material affiliate if it already has a "principal regulator" in order to reduce duplicative/inconsistent regulation and the associated burden on firms. Last, since the Credit Rating Agency Reform Act of 2006, the SEC has the authority to register and oversee rating agencies. Registered nationally recognized statistical rating organizations (NRSROs) are subject to, among other duties and authorities, ongoing disclosure and recordkeeping requirements and SEC examination.

State level	**State securities regulators** (50 states and the District of Columbia) – administer and enforce the state statutes regulating securities transactions. These so-called "blue sky" laws typically include two basic requirements: the registration of securities and the registration and supervision of securities firms and professionals. In addition, state securities statutes commonly include provisions that prohibit securities fraud and that give state authorities the power to enforce those provisions.
CFTC	**The Commodity Futures Trading Commission** – regulates the purchase and sale of commodity and financial futures and options at the federal level. It does not have the authority to regulate transactions of over-the-counter derivatives. There is some overlap across the SEC and the CFTC. For instance, futures contracts on single securities and on narrow-based security indices are jointly regulated by the CFTC and SEC.
Insurance companies are primarily regulated by states. State statutes mainly deal with solvency regulation and consumer protection or market regulation. One of the rare instance in which Congress involved itself in insurance regulation was in 1974 with the enactment of the Employee Retirement Income Security Act (ERISA) that established regulatory requirements for employer-sponsored retirement plans, as well as other benefits such as medical, life, and disability insurance. The Department of Labor administers and enforces ERISA.	
State level	There are 51 separate regulators in the continental United States and Hawaii (50 states and the District of Columbia) and additional regulators in US Territories (Puerto Rico and the US Virgin Islands). The *National Association of Insurance Commissioners* (NAIC) was created in 1871 to address the need to coordinate regulation among the states by providing a forum for the development of uniform policy.

Source: **De Michelis, Andrea (2009):** *Overcoming the Financial Crisis in the United States.* OECD Economics Department Working Paper No. 669, Organisation for Economic Co-operation and Development, Paris, pp. 45 – 46.

The failed regulatory oversight is just a part of the wider paradox of state interventions prior to the crisis. The state massively intervened in areas where it should not have or where its interventions should have been much more limited (housing policy and monetary policy). On the other hand, it has left areas where intervention was needed (regulatory oversight and asset price bubbles) without any serious action. Letting financial institutions operate with rising and dangerously high leverage was an important part of this inaction. It was an international phenomenon based on the Basel Capital Accords (Basel I): a nonbinding, but generally accepted and implemented set of recommendations and guidelines for bank regulation and supervision, which included minimal capital requirements (capi-

tal adequacy system).[47] Under Basel I, banks that operated in multiple countries were required to hold equity capital distinguished in a double way: core capital equivalent to 4 percent of risk-weighted assets (called Tier-1 capital) and a broader definition of capital equivalent to 8 percent of risk-weighted assets (called Tier-2 capital).[48]

Regardless of the different definitions of capital, the main trick was in the calculation of the risk weight of different assets. Capital adequacy rules, instead of setting a simple fix ratio of equity to all the bank's assets, required a ratio of capital to risk-weighted assets which should be calculated from the different risk assigned to various assets. The calculation was complicated and left to the staff of banks, partly using their own risk valuation models. The general rule was that banks were required to hold at least 8 percent capital against an asset in order to be well capitalized: for example a 1 million value loan had to be backed by a capital reserve of 80 thousand. Different risk weights were assigned to different type of assets. Commercial loans received a risk weight of 1 or 100 percent (meaning that the required capital stayed at 8 percent), residential mortgages were considered to be half as risky and were assigned 0.5 or 50 percent (the

47 The Basel Capital Accords (Basel I) were first issued in 1988 by the Basel Committee on Banking Supervision (BCBS), an international committee of bank supervisors set up in 1974 by central bank governors from the countries that made up the G10 group. It was named after the Swiss city of Basel, home to the Bank for International Settlements, under whose auspices the BCBS regularly meets. Basel I was adopted by more than 100 countries including the United States. In 2006 the members of the committee agreed on a renewed and much more detailed (more than 10 times longer than the 37-page original) accord (Basel II), which was gradually implemented by most developed countries but not by the United States. Regardless of its more precise wording, it was still unable to prevent the major banks from losses that posed a systemic risk to the financial system and resulted in massive government help (Roubini – Mihm (2010): 79, 204 – 206).

48 The core (Tier-1) capital essentially consists of the paid-in capital stock, the accumulated retained earnings of the past (reserves), and preferred stock (equity without voting rights). The broader definition of (Tier-2) capital adds to the core capital other items like undisclosed reserves or subordinated debt. The latter refers to debt that will only have to be serviced by the bank after all other liabilities to customers and credit institutions have been met (Sinn (2010): 138).

required capital was 4 percent), asset-backed securities rated AAA or loans to other banks received 0.2 or 20 percent (so the required capital was only 1.6 percent) and claims against states (sovereign debt of investment grade countries) had a weight of zero, thus government bonds were considered so safe that there was no capital needed at all to back these assets (Wallison (2008): 8). Risk weights (defined in Basel II) of more than one or 100 percent were given only in rare examples, e.g. for loans to banks residing in countries with poor ratings or to companies that were rated lower than BB- (Sinn (2010): 139). Another way to lower capital requirements and increase leverage was credit insurance: if the bank for example entered a credit default swap (CDS) contract it could replace the rating of the original credit claim with the rating (and subsequently the assigned risk weight) of the insurer, in this case the CDS seller (ibid. 144). Of course, like the monolines and the champion of the CDS market, AIG, these insurers all had AAA ratings prior to the crisis. In general, Basel capital rules and related US regulation not only allowed banks to do business with low equity/high leverage but also motivated financial institutions to hold low risk-weight mortgages and asset-backed securities (mostly MBS, CDO) – AAA rated or insured with CDS. Basel and US national regulation has not achieved their main goals, i.e. to ensure that banks would have a sufficiently large buffer (the equity capital) in times of crisis, bankers mostly managed to circumvent the requirements completely legally, obeying their letter but not their spirit. The Basel Accords and the national regulations based on it were flawed not just because they considered mortgages and related financial derivatives safer than many other loans and allowed the banks to use their own valuation models but also because they allowed the banks to circumvent even the very low capital adequacy ratios by setting up off-balance sheet entities (like SIVs) which were leveraged sometimes as high as 1 to 100. In addition to this, in America investment banks and GSEs were not subject to the already lax capital standards (4 percent mandatory equity capital-to-asset ratio), thus they operated with higher leverage. This was still not enough for some of the players, so they turned to creative accounting tricks: several investment banks artificially lowered leverage ratios by selling assets right before the reporting period (of quarterly reports) and subsequently buying them back (FCIC

(2011): 65).[49] The kings of the leverage game were the two GSEs. Fannie and Freddie were allowed to run shop with minimal statutory capital requirements equal to the sum of 2.5 percent of their on-balance sheet assets plus 0.45 percent of their off-balance sheet guarantees (Barth et al. (2010): 162). Combined, Fannie and Freddie owned or guaranteed $5.3 trillion of mortgage-related assets at the end of 2007 against just $70.7 billion of capital, a ratio of 75:1 (FCIC (2011): 65).

However, one has to note that American banks in general (especially the commercial banks) were better capitalized than European ones. As demonstrated in Table 8, while under the Basel II rules European banks seemed to have Tier 1 capital ratios at a reasonable level, when compared to the ratio of equity to total assets, "reasonable" in fact is rather an inflated level. For example, in 2007 the largest Swiss and German banks, UBS and Deutsche bank had just 1.9 percent of equity relative to their total assets but under Basel rules their risk-weighted equity capital ratios were well above 8 percent. American commercial banks were slightly better off because the difference between the European and US accounting rules would lower the real differences (Sinn (2010): 145 – 146).

49 "Repo 105" transactions used by Lehman Brothers became the best known example of accounting tricks used to understate the leverage. "Repo 105" was an accounting maneuver to temporarily remove assets from the balance sheet before each reporting period. Martin Kelly, Lehman's global financial controller, stated that the transactions had "*no substance*" – their "*only purpose or motive . . . was reduction in the balance sheet*" (FCIC (2011): 177). It was used from 2001 onwards: at the end of each quarter Lehman sold some of its loans and investments temporarily to other financial institutions for cash using a short-term repurchase agreement (repo) and (because they were valued at 105 percent or more of the cash received) the transaction counted as a sale under accounting rules and Lehman was able to report a less risky balance sheet with lower leverage (Buckley (2011): 181).

Table 9: **Equity Asset Ratios and Tier 1 Ratios of Major US and European Banks in 2007**

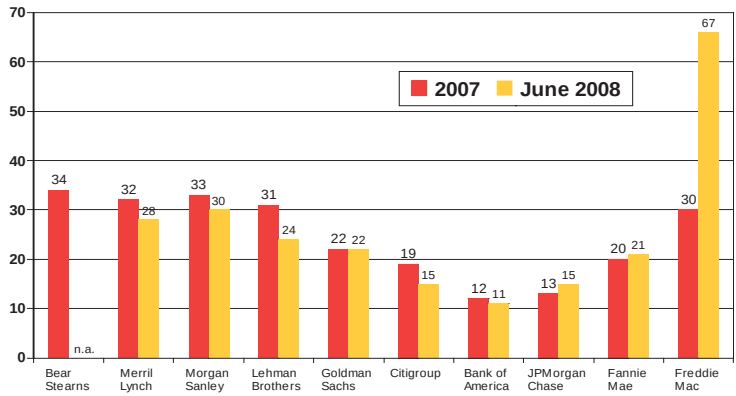
	Equity asset ratio (%) *	Tier 1 ratio (%) **
US financial institutions		
Citigroup	5.2	7.1
Wachovia	9.8	7.4
Freddie Mac	3.4	-
Fannie Mae	5.0	-
Merrill Lynch	3.1	-
Washington Mutual	7.5	6.8
Bank of America	8.6	6.9
Wells Fargo	8.3	7.6
US banking system***	8.7	
Swiss banks		
UBS	1.9	8.8
Credit Suisse	3.2	11.1
Swiss banking system	4.0	
British banks		
Barclays Bank	2.1	7.5
HBOS	3.3	7.4
HSBC	5.4	9.3
Lloyds TSB	3.4	9.5
Royal Bank of Scotland	4.8	7.3
British banking system	5.3	
German banks		
Deutsche bank	1.9	8.6
Commerzbank	2.6	7.0
HypoVereinsbank (Unicredit)	5.7	17.9
Hypo Real Estate	1.5	7.0
LB Baden-Württemberg	2.3	8.3
German banking system	4.0	
Further euro banks		
Santander (Spain)	5.7	7.7
Unicredit Group (Italy)	5.6	6.6
BNP Paribas (France)	3.2	7.3
Credit Agricole (France)	3.3	8.1
KBC (Belgium)	5.2	9.0
Dexia (Benelux)	2.7	9.1
ING Group (The Netherlands)	3.0	7.4
Euro banking system	6.7	

Notes: * Equity capital divided by total assets (inverse of the so-called leverage ratio).
** Tier 1 capital divided by the sum of risk positions. Tier 1 capital differs from the equity capital shown in the balance sheet, since according to Basel II accounting standards, immaterial assets (e.g. the difference between the purchase price and book value of the equity capital of an acquired firm) as well as one's own stocks must be deducted from equity capital.
*** Commercial banks, savings institutions, security brokers and dealers (investment banks), government-sponsored enterprises.

Source: **Sinn, Hans-Werner (2010):** *Casino Capitalism. How the Financial Crisis Came About and What Needs to be Done Now.* Oxford University Press, Oxford, pp. 142 – 143.

In general the crisis showed that both American and European banks had insufficient equity capital ratios (or, in other words, were leveraged too much) to face a major financial turmoil. Most European banks were simply lucky to have smaller exposure to American toxic assets than their counterparts on the other side of the Atlantic. Not accidentally, highly leveraged actors of shadow banking were among the first to collapse during the crisis. The fragility of the financial institutions was rising together with their leverage. The first casualties were the off-balance sheet entities of banks (SIVs and hedge funds), followed by the investment banks and the GSEs. It has always been clear that financial companies that grow too big, with too little of their own capital, are a recipe for disaster. Prior to the crisis, this is exactly what happened under the nose of government regulators. They should have stopped this development, preventing the banks from taking excess risks. Instead of this, they helped to develop the two largest semi-government financial enterprises in the world with the highest leverage ever allowed.

Figure 8: **Selected American Financial Institutions' Leverage Ratios** (total assets/total shareholder equity)



Source: **Barth, James R et al. (2009):** *The Rise and Fall of the U.S. Mortgage and Credit Markets. A Comprehensive Analysis of the Market Meltdown.* The Milken Institute, John Wiley & Sons, Hoboken, New Jersey, p. 163.

There are various possible reasons why the US government did not intervene until it was too late and too costly: Washington politics was full of former bankers, lobbyists and campaign contributions from the financial sector, but first and foremost of convinced policy makers believing that the development in the financial sector would benefit America. This

belief was based on sound data. The share of finance in US GDP, corporate profits, employment, tax revenues and – last but not least – campaign contributions had been continuously rising for years. The financial sector made 2.5 percent of the GDP in 1947, its share soared to 4.4 percent in 1977 and 7.7 percent in 2005; by that time financial firms accounted for upwards of 40 percent of the earnings of the companies listed in the S&P 500 (Roubini – Mihm (2010): 190). From 1973 to 1985, the financial sector never earned more than 16 percent of domestic corporate profits; in 1986, that figure reached 19 percent; in the 1990s, it oscillated between 21 percent and 30 percent, higher than it had ever been in the postwar period; after 2000 it reached 41 percent (Johnson (2009)). "*Pay rose just as dramatically. From 1948 to 1982, average compensation in the financial sector ranged between 99 percent and 108 percent of the average for all domestic private industries. From 1983, it shot upward, reaching 181 percent in 2007*." (ibid.) From 1999 through 2008 federal lobbying by the financial sector reached $2.7 billion; campaign donations from individuals and political action committees (PACs) topped $1 billion (FCIC (2011): 55). However, most decision makers were convinced anyway about the benefits of Wall Street for the American economy:

"The banking-and-securities industry has become one of the top contributors to political campaigns, but at the peak of its influence, it did not have to buy favors the way, for example, the tobacco companies or military contractors might have to. Instead, it benefited from the fact that Washington insiders already believed that large financial institutions and free-flowing capital markets were crucial to America's position in the world. One channel of influence was, of course, the flow of individuals between Wall Street and Washington. Robert Rubin, once the co-chairman of Goldman Sachs, served in Washington as Treasury secretary under Clinton, and later became chairman of Citigroup's executive committee. Henry Paulson, CEO of Goldman Sachs during the long boom, became Treasury secretary under George W. Bush. John Snow, Paulson's predecessor, left to become chairman of Cerberus Capital Management, a large private-equity firm that also counts Dan Quayle among its executives. Alan Greenspan, after leaving the Federal Reserve, became a consultant to Pimco, perhaps the biggest player in international bond markets. These personal connections were multiplied many times over at the lower levels of the past three presidential administrations, strengthening the ties between Washington and Wall Street. It has become something of a tradition for Goldman Sachs employees to go into public service after they leave the firm. The flow of Goldman alumni – including Jon Corzine, now the governor of New

Jersey, along with Rubin and Paulson – not only placed people with Wall Street's worldview in the halls of power; it also helped create an image of Goldman (inside the Beltway, at least) as an institution that was itself almost a form of public service." (Johnson (2009))

Another revolving door between government offices and the private sector worked in the triangle of Washington politics, government sponsored enterprises and private companies related to housing and housing finance. The list of Washington insiders with good political connections making their fortune in the housing business is a long one, Fannie and Freddie especially worked like magnets for former government officials who were paid big bucks to defend the company's federal privileges (DeHaven (2009): 12).[50]

50 A few examples from a long list: Former Fannie Mae CEO Jim Johnson managed Walter Mondale's 1984 presidential campaign, chaired the vice presidential selection committee for John Kerry, and was involved in President Obama's vice presidential selection process. Johnson received a cut-rate mortgage on his home from Countrywide Financial, which was a major business partner of Fannie Mae's. Former Fannie Mae CEO Franklin Raines was a director of the Office of Management and Budget under President Clinton. Raines, who left Fannie in the wake of an accounting scandal, earned over $90 million in compensation between 1998 and 2004. Raines was the subject of a federal investigation into whether he manipulated Fannie Mae earnings to maximize his bonuses, and ultimately settled for a $25 million fine. Raines was also one of the insiders who received a specially discounted home mortgage rate from Countrywide Financial. Clinton deputy attorney general Jamie Gorelick became a Fannie Mae vice-chairman following her stint with the administration. She earned over $26 million in compensation from Fannie Mae between 1998 and 2002. Former Fannie Mae senior vice-president John Buckley was a Republican congressional staffer and senior adviser to the presidential campaigns of Ronald Reagan and Bob Dole. Former Fannie senior vice-president Arne Christenson was a senior adviser to Republican House Speaker Newt Gingrich. Rep. Barney Frank's (D-MA) partner Herb Moses was an executive at Fannie Mae from 1991 to 1998 while Frank sat on the House Banking Committee, which was responsible for overseeing the GSEs. President Clinton appointed current White House chief of staff Rahm Emanuel to Freddie Mac's board of directors, where he earned $320,000 in compensation and sold stock worth more than $100,000. Emanuel was a senior adviser to Clinton between 1993 and 1998 (DeHaven (2009): 12).

Investors were well aware of this good relationship between Wall Street and Washington, but there was an even more important reason why they continued – rationally – to fund shadow banking including the two GSEs: they considered them to be "too big to fail". In case of major problems they counted on a very probable government rescue ("bailout") of these institutions, especially Fannie and Freddie (in other cases they often bought CDS protection). A wider conception of bailout can include various measures by the Fed and federal government bodies (especially the Treasury and FDIC); investors counted with most of these interventions usually based on historic experience. "*Two weeks before the Fed cut short-term rates in January 2001, the Economist anticipated it: "the 'Greenspan put' is once again the talk of Wall Street. . . . The idea is that the Federal Reserve can be relied upon in times of crisis to come to the rescue, cutting interest rates and pumping in liquidity, thus providing a floor for equity prices." The "Greenspan put" was analysts' shorthand for investors' faith that the Fed would keep the capital markets functioning no matter what*." (FCIC (2011): 60 – 61) Apart from the traditional and institutionalized measures of the Fed (cutting interest rates and providing liquidity through the discount window) there were rather exceptional steps mostly by the FDIC and the Treasury that investors could also count on. We will use this narrower definition of bailouts (from McKinley and Gegenheimer 2009) for the purpose of this analysis.[51] The intention of the legislators when adopting the Federal Deposit Insurance

51 McKinley and Gegenheimer (2009: 2 – 3) define a bailout of a financial institution as possessing the following elements: (1) government intervention through lending, equity injection, purchase of assets, assisted takeover, loan guarantee, or other tangible benefit, or inaction through regulatory forbearance for a financial institution or group of financial institutions. In the case of a transaction, the repayment of funds extended must be at risk, either because it is not fully collateralized or otherwise fully protected. (2) The action taken is preemptive, in that the financial institution benefiting from intervention does not fail and go out of business through revocation of an operating charter and placement into FDIC receivership (commercial banks) or bankruptcy (non-commercial banks), but remains a going concern, thus benefiting creditors, shareholders, or counterparties of the financial institution. (3) In the absence of a bailout, the financial institution would either be forced to go into receivership or bankruptcy in the prescribed legal form, or have its role in financial intermediation disrupted.

Corporation Improvement Act of 1991 (FDICIA) was to limit the possibility of these bailouts as much as possible. Under this act the FDIC may undertake its open-bank assistance program (OBA) only if it is the least-cost method or in "*those rare instances in which the failure of an institution could threaten the entire financial system*" (McKinley – Gegenheimer (2009): 7). (This second option is often referred to as the systemic-risk exception; financial firms whose disorderly failure would be likely to create system-wide instability are called systemically important financial institutions – SIFIs.) Needless to say, institutions of shadow banking were not subject to FDIC help, nor to lending from the Fed's discount window.[52] In theory, there should be no special help from government bodies to these actors "in shadow". There were many public

51 Based on this definition, examples of financial-institution bailouts from the last financial crisis in America would include the Federal Deposit Insurance Corporation's bailout of Citigroup in 2008; the Federal Reserve's bailout of Bear Stearns and American International Group; and the Treasury's Troubled Asset Relief Program and bailouts of Fannie Mae and Freddie Mac. Under this definition, transactions that would not be considered bailouts would be the FDIC's purchase-and-assumption or payoff transactions, in which a troubled institution does not remain a going concern. Additionally, the exercise of the Federal Reserve's lender-of-last-resort powers would not be considered a bailout as these loans are traditionally fully collateralized. Interestingly enough, the so-called "savings and loan bailout" of the 1980s and 1990s, which involved the creation of the Resolution Trust Corporation, would not be a financial-institution bailout under this definition, as the transactions were structured to eliminate the institutions as going concerns.

52 In spite of the fact that the overall direction of the changes codified under FDICIA (Federal Deposit Insurance Corporation Improvement Act of 1991) was to restrict the use of the federal financial safety net and the discretion of the FDIC, there was one exception to that general principle. Under FDICIA there was an amendment to Section 13(3) of the Federal Reserve Act and the power to lend under "unusual and exigent circumstances" to "any individual, partnership or corporation" when it "is unable to secure adequate credit accommodations from other banking institutions." This change, which was inserted by Sen. Christopher Dodd (D-CT), was adopted without extensive discussion or debate, but the intention was to allow fully secured Federal Reserve lending to securities firms in the aftermath of the 1987 stock market crash (McKinley – Gegenheimer (2009): 7).

statements underlying it, even in the case of Fannie Mae and Freddie Mac (which were called "government sponsored" enterprises and had many privileges in their charters given by the government). A good example to illustrate this could be the opening statement of representative Barney Frank (D-MA) at a hearing before the Committee on Financial Services in the US House of Representatives (September 10, 2003) addressing the question of government backing of the GSE's debt: "*But there is no guarantee, there is no explicit guarantee, there is no implicit guarantee, there is no wink-and-nod guarantee. Invest, and you are on your own*" (cited by White (2008): 7). Investors rather relied on historic experience and common sense. For example, they drew on lessons from the bailout of Continental Illinois National Bank and Trust (1984) by the FDIC, the bailout of Fannie Mae during the early 1980s (limited tax relief and regulatory forbearance in the form of relaxed capital requirements by the federal government), the bailout of the Farm Credit System with financial help from the Farm Credit System Financial Assistance Corporation (created by the Agricultural Credit Act of 1987) and the bailout of Long-Term Capital Management (LTCM) arranged (but not funded) by the Fed (McKinley – Gegenheimer (2009): 5 – 8). Or they just expected that the government would not allow the two semi-government GSEs (also the two largest financial corporations of the world and America) to collapse. The crisis surrounding Long-Term Capital Management (LTCM), a hedge fund that suffered heavy losses and liquidity tensions as a result of the Asian and Russian financial crises in 1997 – 98 and had to be bailed out by major banks under the auspices of the Federal Reserve Bank of New York in September 1998, also illustrated a new dimension of the "too big to fail" problem – sometimes referred to as 'too interconnected to fail' (Goldstein – Véron (2011): 6). With assets in excess of $100 billion, LTCM was not huge, but it was felt that its bankruptcy would cause a chain reaction throughout the financial system that could have catastrophic consequences as assets would have to be liquidated at fire-sale prices (ibid.). During the latest financial crisis this problem returned on a much larger scale. The development showed again, that the letters of the regulations and the intentions behind them as well as political declarations are one thing and the steps of government bodies reacting to the global uncertainty and panic are another. The main problem was that all major actors of shadow banking (the two GSEs, AIG and the five Wall Street investment banks) as well as some large commercial banks (like Citigroup) became so interconnected in the huge opaque network of mortgage-related securities and derivatives that their collapse would certainly "threaten the entire financial system" (or at least nobody could find out the consequences of

their collapse). In other words, they were not just too big but also too interconnected to fail. It is not surprising that most of them were rescued with some kind of government assistance and the bankruptcy of the only big player which was left without a bailout (Lehman Brothers) led to a global credit crunch:

"On Monday 15 September 2008, Lehman filed for bankruptcy, which the Court approved on Friday of the same week. With assets of USD639 billion, it was the largest bankruptcy in US history. The firm had about 24,000 employees (5,000 in the UK). It transpired that Lehman had about 3,000 legal entities globally – more than 100 in Luxemburg alone... Alarm over counterparty risk on Lehman's 1.2 million derivative contracts turned to panic. Markets were guessing which banks would be likely to be hurt – and maybe, wiped out – by counterparty failure. Panic and fear combined to paralyze money markets. Bank A did not wish to lend to bank B because of the fear that bank B would be likely to fail as a result of its exposure to Lehman Brothers... The opaqueness of mortgage-backed securities and credit default swaps made it impossible for banks to tell how much other banks had invested in toxic loans or what their losses might be. Hedge funds in New York and London found their assets frozen. Around the globe banks were not prepared to lend to other banks. The inter-bank lending market almost completely dried up and there was a huge contraction in credit. This was the credit crunch. Stock markets went into meltdown, wiping USD600 billion off equity values." (Buckley (2011): 180.)

As Lehman failed, only in the main bankruptcy proceeding (there were about 80 insolvency proceedings of Lehman's subsidiaries in 18 foreign countries) about 66 thousand claims – exceeding $873 billion – had been filed against it as of September 2010 (FCIC (2011): 340). Just the next day after Lehman was bankrupt – in the midst of a global credit crunch and panic – the government bodies did not hesitate any more and the New York Fed pumped $85 billion to the insurance giant AIG (later the bailout increased to $182 billion and resulted in 79.9 percent equity ownership by the US government – with 80 percent or more the bank's debt would have had to be included in the official government debt figure). The American International Group, the largest insurance company in America and the world is perhaps the best example to illustrate the "too big and too interconnected to fail" problem. AIG – or better to say its Financial Products division (founded in 1987 and moved to London in 1994) – was massively involved in the CDS market (it had been selling huge amounts of CDS protection but without posting one

dollar's worth of initial collateral or making any other provision for loss). AIG built up a $2.7 trillion over-the-counter derivatives portfolio of which $1 trillion was concentrated in only 12 counterparties, large American and European banks (FCIC (2011): 348). By mid-2007, it was holding around $560 billion of super-senior risk (mostly CDS on AAA-rated CDO tranches and securities) which was considered super-safe in the case of mortgage-backed securities and CDOs created from them (Buckley (2011): 189). But as we already know, many of these super-safe securities started to default in increasing numbers from 2007, forcing AIG to pay vast amounts of money to counterparties and to put up even more in collateral as required in the wording of its swap contracts (because rating agencies started the process of massive downgrading of securities with AAA ratings). AIG in 2008 produced America's and perhaps the world's biggest annual loss ever, which reached almost $100 (precisely 99.3) billion (FCIC (2011): 350). It would have certainly collapsed without a bailout, bringing down a number of large banks (both US and European) which insured their securities including MBSs and CDO tranches by entering into CDS contracts with AIG. The failure of AIG (or even the downgrade of its AAA rating) would have forced the banks to increase their capital (as American and European banks had lowered credit risk – and, as a result, lowered capital requirements – by buying credit default swaps from AIG). Since nobody knew the exact exposures of specific banks to AIG, confidence in the entire banking system would have plummeted. Needless to say, the failure would also endanger AIG's other activities (business in almost every class of insurance). Table 10 shows the payments to the major counterparties of AIG after its rescue (most of which – more than 60 billion dollars just during the few months following the bailout – was made from government, i.e. taxpayer, money of course). Most counterparties would have probably gone bankrupt in the absence of these payments. For example, Deutsche Bank received $11.8 billion in insurance payments from AIG in 2009 alone – considering that the bank's own equity capital was $30.7 billion, it was a substantial amount of cash during the most difficult times of the crisis (Sinn (2010): 61). It is important to note that AIG's counterparties did not incur any losses on their investments – because AIG, once it was backed by the government, paid claims to CDS counterparties at 100 % of face value – this decision has been widely criticized (FCIC (2011): 378).

Table 10: **Payments to AIG Counterparties mostly from Taxpayer Money** (billions of dollars)

Payments to AIG Securities Lending Counterparties (18 Sept. to 12 Dec. 2008)		**Payments to AIG Credit Default Swap Counterparties (As of 17 Nov. 2008)**		
			Maiden Lane III payment	**Collateral payments from AIG**
Barclays	7.0	Société Générale	6.9	9.6
Deutsche Bank	6.4	Goldman Sachs	5.6	8.4
BNP Paribas	4.9	Merrill Lynch	3.1	3.1
Goldman Sachs	4.8	Deutsche Bank	2.8	5.7
Bank of America	4.5	UBS	2.5	1.3
HSBC	3.3	Calyon	1.2	3.1
Citigroup	2.3	Deutsche Zentral-Genossenschafts-bank	1.0	0.8
Dresdner Kleinwort	2.2	Bank of Montreal	0.9	0.5
Merrill Lynch	1.9	Wachovia	0.8	0.2
UBS	1.7	Barclays	0.6	0.9
ING	1.5	Bank of America	0.5	0.3
Morgan Stanley	1.0	Royal Bank of Scotland	0.5	0.6
Société Générale	0.9	Dresdner Bank AG	0.4	0.0
AIG International	0.6	Rabobank	0.3	0.3
Credit Suisse	0.4	Landesbank Baden-Wuerttemberg	0.1	0.0
Paloma Securities	0.2	HSBC Bank USA	0.0	0.2
Citadel	0.2			
TOTAL	**43.7**	**TOTAL**	**27.1**	**35.0**

Of this $43.7 billion total, $19.5 billion came from Maiden Lane II, $17.2 billion came from the Federal Reserve Bank of New York, and $7 billion came from AIG.

Source: **FCIC – Financial Crisis Inquiry Commission (2011):** *The Financial Crisis Inquiry Report. Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States.* U.S. Government Printing Office, Washington D.C., p. 377. Based on Special Inspector General for TARP data.

The absence of a clear government rule (and its consistent use) on the "too big to fail" problem and the many historic examples of various bailouts contributed (especially in the case of GSEs) to the development of a large scale moral hazard within the financial system which later resulted in a colossal bill for taxpayers. To return to the broader picture of the long list of government failures, we can conclude with the words of Wallison:

"(T)he crisis would not have become so extensive and intractable had the US government not created the necessary conditions for a housing boom by directing investments into

the housing sector, requiring banks to make mortgage loans they otherwise would never have made, requiring the GSEs to purchase the secondary mortgage market loans they would never otherwise have bought, encouraging underwriting standards for housing that were lower than for any other area of the economy, adopting bank regulatory capital standards that encourage bank lending for housing in preference to other lending, and adopting tax policies that favored borrowing against (and thus reducing) the equity in a home." (Wallison (2008): 7)

Chapter 5

The "great moderation" in the world economy enlarged and prolonged the US bubble

"Welcome to the wonderful dual country of 'Chimerica' – China plus America – which accounts for just over a tenth of the world's land surface, a quarter of its population, a third of its economic output and more than half of global economic growth in the past eight years. For a time it seemed like a marriage made in heaven. The East Chimericans did the saving. The West Chimericans did the spending. Chinese imports kept down US inflation. Chinese savings kept down US interest rates. Chinese labour kept down US wage costs. As a result, it was remarkably cheap to borrow money and remarkably profitable to run a corporation. Thanks to Chimerica, global real interest rates – the cost of borrowing, after inflation – sank by more than a third below their average over the past fifteen years. Thanks to Chimerica, US corporate profits in 2006 rose by about the same proportion above their average share of GDP. But there was a catch. The more China was willing to lend to the United States, the more Americans were willing to borrow. Chimerica, in other words, was the underlying cause of the surge in bank lending, bond issuance and new derivative contracts that Planet Finance witnessed after 2000. It was the underlying cause of the hedge fund population explosion. It was the underlying reason why private equity partnerships were able to borrow money left, right and centre to finance leveraged buyouts. And Chimerica – or the Asian 'savings glut', as Ben Bernanke called it – was the underlying reason why the US mortgage market was so awash with cash in 2006 that you could get a 100 per cent mortgage with no income, no job or assets."

Niall Ferguson, 2008
(Ferguson, Niall (2008): *The Ascent of Money. A Financial History of the World*. Allen Lane, London, pp. 335 – 336.)

While the American economy was recovering from the mild 2001 recession, the world economy as a whole also stabilized. After

a series of devastating financial crises (notably the 1997-98 Asian financial crisis, the sovereign debt default of Russia in August 1998 and the collapse of Argentina in late 2001) the emerging markets soon returned to growth. The first years of the third millennium entered history as the era of "great moderation" when the world economy experienced high growth, low inflation, declining real interest rates and booming stocks, bonds, commodities and derivatives markets as well as asset prices. This is quite an impressive and unusual record, especially when considering that most countries – both developed and emerging economies – enjoyed growth. However, this growth also could be characterized by many anomalies and rising imbalances in the world economy. These imbalances not only prolonged the era of great moderation but also the debt-driven boom cycles in some major economies, including the United States.

The following anomalies questioned the sustainability of this growth:

- Some developed countries (like the US, southern EU members, notably Spain) had high and increasing trade and current account deficits and became (large-scale) net importers of capital, while other countries, both developed and emerging economies (like Germany, Japan, China and major oil exporters), had high and increasing surpluses on their trade and current account balance and started to export large amounts of capital to the previous group. Paradoxically, some of the richest states were net borrowers financed by less developed countries. For the first time in history, capital was flowing from poorer to richer nations.
- Despite relatively high (and sometimes rising) fiscal deficits in some countries, notably the United States, the price of borrowing, i.e. interest rates, remained low. One would expect high fiscal deficits to lead to higher and not lower interest rates (Wolf (2009): 59). The answer is again in the large amount of capital streaming in from the net lending economies that kept the interest rates of the US Treasuries low.
- Monetary policy – similarly to fiscal policy – had a much more limited effect than economic theory would suggest. For example, the monetary tightening in the US between 2004 and 2006 had had almost no effect: the Fed under Alan Greenspan raised the federal funds target rate from 1 to 5.25 percent only to realize that long-term interest rates and fixed-rate mortgage rates barely moved (Roubini – Mihm (2010): 81). Economic textbooks would have predicted exactly the opposite to happen. But again,

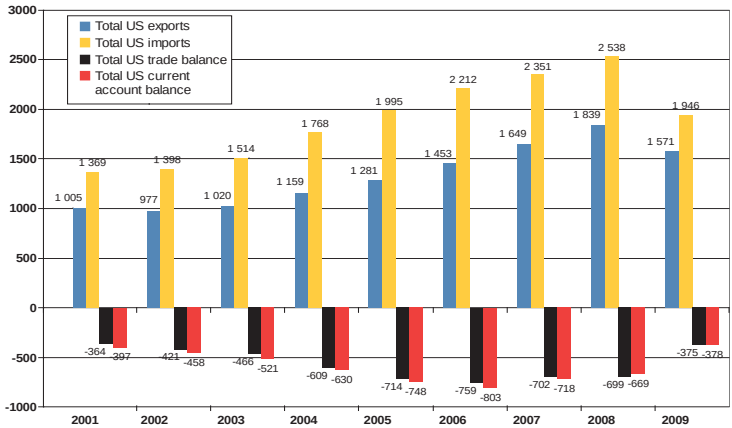
America and its mortgage market were so awash with cash from capital exporter countries that interest rates remained low.

- High economic growth together with rising and relatively high employment (and declining unemployment) levels in some major economies normally should have led to higher wage increases and resulting higher inflation, provoking earlier monetary tightening. Deepening globalization (a rising influx of cheap foreign goods and labor), however, kept prices and wage inflation at relatively low levels, enabling Western central banks to keep interest rates at historically low levels for a longer time.

Perhaps the most striking of all anomalies were the perverse capital flows from poorer to richer countries. Considering that an average American earned more than $34 000 a year and an average Chinese less than $2000, it is quite bizarre that China became the largest net lender to the United States (Ferguson (2008): 334). It is also historically unprecedented that the world's most advanced and largest economy (and the issuer of the world's most significant currency) also became the largest net recipient of capital, "the world's borrower and spender of last resort" (Wolf (2009): 58 – 59). According to Martin Wolf, the willingness of the Asian countries to finance America was the result of lessons they had learned during the 1997-98 Asian financial crisis (ibid. 58 – 110). The large and mostly uncontrolled influx of foreign capital to these countries prior to 1998 (especially the fact that much of the capital was highly speculative and much of the debt that private sectors of Asian countries accumulated was short-term and denominated in foreign currencies) increased their vulnerability to financial shocks. Consequently, after the crisis they tried to insure themselves by using export-oriented growth relying on highly competitive exchange rates (which were called floating but in fact were managed), running trade and current account surpluses, and accumulating the net revenues in the form of official reserves to create a substantial buffer against future crises. In doing so, they basically followed China, which suffered no crisis in 1997-98, mainly because it had retained capital controls, devalued the yuan-renmimbi in 1994 and fixed its exchange rate to the dollar, allowing only limited floating and appreciation of its currency in certain periods despite rising international pressure (Ferguson (2008): 334). These policies resulted in the gigantic accumulation of foreign-exchange reserves by emerging economies led by China (demonstrated in Figure 11). According to IMF data, these official reserves increased more than fivefold from less than one to over 5 trillion US dollars just between 2001 and 2008,

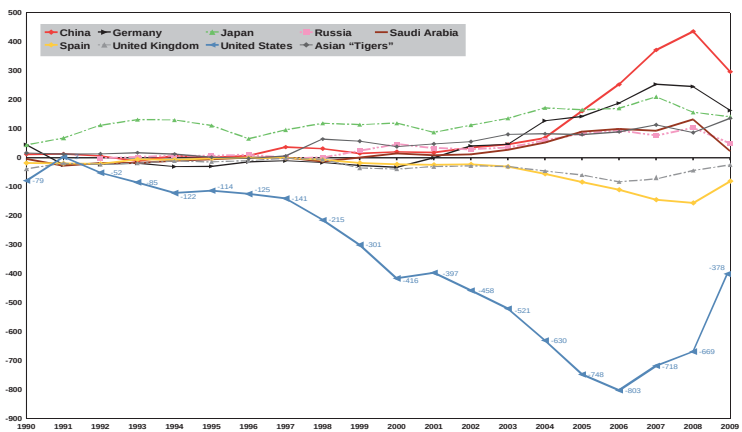
China alone accounted for about 40 percent of this increase, expanding its reserves tenfold from 216 to 2 134 billion dollars.

Figure 9: **Rising External Imbalances of the American Economy** (US trade in goods and services, trade and current account balances, billions of dollars)



Source: **Bureau of Economic Analysis**

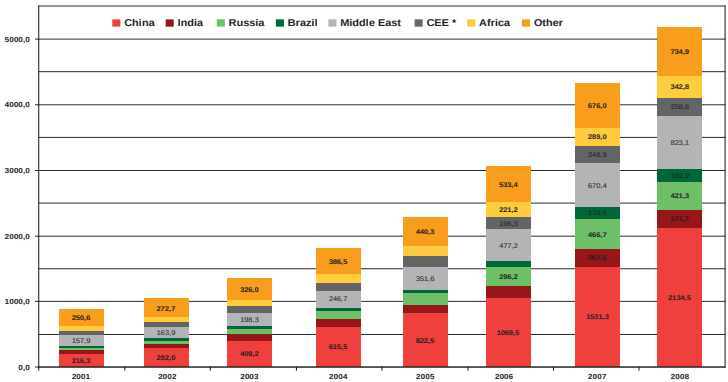
Figure 10: **Current Account Balances of Some Major Economies and a Group of Countries** (billions of US dollars)



Notes: Asian "Tigers" = newly industrialized Asian economies composed of 4 countries: Hong Kong SAR, Korea, Singapore and Taiwan Province of China.

Source: **IMF – International Monetary Fund: World Economic Outlook (WEO) database,** October 2010

Figure 11: **Official Reserves of Emerging and Developing Economies** (including gold, billions of US dollars)



Note: Official holdings of gold are valued at SDR 35 an ounce; this convention results in a marked underestimation of reserves for countries that have substantial gold holdings. *Central and Eastern Europe.

Source: **IMF – International Monetary Fund (2009):** *World Economic Outlook April 2009. Crisis and Recovery.* Washington, D.C. p. 214.

In spite of the gradually declining share of US dollars in official reserves in 2007, still more than 63 % of all global official foreign exchange reserves were kept in American dollars (Buiter – Sibert (2008): 20). These reserves were invested back into American assets, mostly treasury bonds, but also increasingly into other securities, especially mortgage-backed securities issued by the GSEs (implicitly guaranteed by the US government). The rising shares of these official reserves were managed by sovereign wealth funds, entities created by governments to invest part of the reserves to higher yielding assets. By the end of 2007, sovereign wealth funds had around $2.6 trillion under management, more than all the world's hedge funds, and not far behind government pension funds and central bank reserves (Ferguson (2008): 337). But not only did governments invest their accumulated dollar reserves back into American securities, private companies (especially many European banks) were also among the buyers. According to some estimates, between 40 and 50 percent of the securities generated by American financial institutions ended up in the portfolios of foreign investors (Roubini –Mihm (2010): 81). In this way, foreign investors – both state and private – helped to increase the US housing bubble and to prolong the debt-driven boom cycle in the American economy.

International migration also contributed to the undisturbed expansion of the US economy. Together with the rising productivity and competition of cheaper foreign made goods, it helped to create downward pressure on wage costs and production and consumer prices. This is especially true for the sectors which produced non-tradable goods and services. In theory, the higher economic growth in these sectors – in the absence of foreign competition (and many times also the non-existing possibilities for significant productivity growth) – was meant to lead to higher increases in wages and prices fuelling inflation. However, the influx of foreign labor to these sectors curbed wage growth. Foreign-born workers were overrepresented in most sectors producing non-tradable goods and services such as construction, cleaning, personal care, food preparation and serving, but also in general industrial production and agriculture.

Table 11: **Occupational Distribution of Workers Ages 25 to 64 in the USA by Nativity** (2004, percent)

Occupation Group	Total	Native--Born Workers	Foreign-Born Workers	
			Total	Born in Mexico and Central America
Production	7.1	6.4	11.0	15.6
Construction and Extraction	6.1	5.6	9.2	17.3
Office and Administrative Support	13.6	14.5	8.9	6.2
Sales and Related	10.4	10.7	8.8	5.7
Building and Grounds Cleaning and Maintenance	3.6	2.8	8.4	15.0
Management	11.7	12.4	7.5	3.3
Transportation and Material Moving	5.9	5.7	6.9	10.0
Food Preparation and Serving Related	3.5	2.9	6.8	9.4
Health Care Practitioner and Technical	5.3	5.4	4.8	0.9
Personal Care and Service	2.9	2.8	3.7	2.5
Installation, Maintenance and Repair	3.9	3.9	3.3	4.0
Education, Training and Library	6.1	6.5	3.3	1.3
Computer and Mathematical Science	2.5	2.4	3.2	0.3
Business and Financial Operations	4.5	4.8	2.9	0.8
Health Care Support	2.0	1.9	2.5	1.2
Architecture and Engineering	2.2	2.2	2.1	0.3
Farming, Fishing and Forestry	0.6	0.4	1.7	3.9
Arts, Design, Entertainment, Sports and Media	2.0	2.1	1.4	0.7
Life, Physical and Social Science	1.1	1.1	1.1	0.1
Protective Services	2.1	2.3	1.0	0.5
Community and Social Services	1.7	1.8	1.0	0.7
Legal	1.3	1.4	0.5	0.2
Total	**100.0**	**100.0**	**100.0**	**100.0**

Note: Occupation groups are ordered by the percentage of foreign-born workers employed in them.
Source: **CBO – Congressional Budget Office (2005):** *The Role of Immigrants in the U.S. Labor Market*. Congressional Budget Office, United States Congress, Washington D.C. p. 12.

The foreign-born labor force in the US grew from 10.0 percent (12.9 million) in 1994 to 14.5 percent (21.4 million) in 2004 and to 15.5 percent (24 million or more than one in seven) in 2009 (CBO (2010): 2, CBO (2005): 3). Immigrant workers in the first quarter of 2007 made up 37 % of employees in farming, fishing and forestry, 36 % in cleaning and maintenance, 29 % in construction and extraction, 22 % in production and food preparation and serving (Camarota – Jensenius (2009): 16).

The processes of deepening globalization played a key role in American economic development, basically enabling the US to live far beyond its means for far too long. The large and increasing influx of foreign capital especially sustained the economic boom. However, it would be a misplaced analysis to blame the crisis on China and other creditors to the United States by shifting the blame to their excessive savings – the "global savings glut" as Ben Bernanke called it – which in search of investment mostly ended up in America (Roubini –Mihm (2010): 81 and Wolf (2009): 58). It is important to note that global imbalances and the stream of foreign capital to the United States were just some of many reasons that led to the crisis; alone they could not cause it. But combined with financial innovation (the development of new types of mortgages, lowered underwriting standards and securitization), shadow banking, lax monetary, fiscal and regulatory policies, and problems of moral hazard, the easily available foreign money helped brew a mortal cocktail. It is also important to note that the use of this easy foreign money was just an opportunity and not a necessity for the United States. Nobody forced the Americans to borrow mortgages they could not afford, or the federal government in Washington to run fiscal deficits and give explicit or implicit backing for ever rising amounts of mortgage loans and mortgage-backed securities, or the Fed to keep interest rates too low for too long. The foreign capital just enabled them to do these things on a larger scale for a longer time. Basically, there is no clear causal relationship between the mirror images of large US current account deficits (and resulting capital imports) and large current account surpluses (and resulting capital exports) of some other countries. They were equally the cause and effect of each other, being rather like two sides of the same coin, not the elements of a causal link.

Conclusions

In this final concluding part we will try to summarize the main causes and factors that contributed to the last crisis, the most important signs which (with great probability) will signalize all upcoming financial crises, and finally, we offer some policy proposals which might be considered by legislators when trying to prevent another similar crisis from developing.

The most important signs of an upcoming financial crisis are the following:

- Some kind of macroeconomic shock ("displacement", for example a technical or financial innovation), which significantly increases profit opportunities in at least one sector of the economy.
- An above-average rise in asset prices, overvaluation by historic standards and compared to reasonable levels. New investors – without previous experience in the given market segment – rush in to make their fortune because of spectacular profit opportunities. Usually a self-sustaining bubble (positive feedback loop) forms. Price increases are fuelled more and more by the incoming stream of investment and not by the expectations based on underlying fundamental values (based upon the net present value of future cash flows).
- Significantly rising indebtedness (as a percentage of GDP) of households, companies and the government, but especially the financial sector, and falling household savings rates.
- Increasing leverage in the financial sector.
- Monetary expansion: relatively low inflation allows for low interest rates, cheap credit is flowing into the economy; there is an above-average rise in money supply. Quite often central bank interest rates are below the levels that would be consistent with a targeted inflation rate (around 2 %, let's say), sometimes even below actual inflation (negative real interest rates).
- Rising external imbalances, growing deficits on the current account, increasing foreign debt.
- Most investors are arguing that "this time is different", many are talking about a "new paradigm" (to explain why this time the asset prices have reached a sustainable high level and are not going to fall).

Of course, all the signs listed above do not have to be present to create a crisis, but most would likely be there (as they were

prior to the latest financial crisis). When all of these signs can be observed, the question is not if the crisis will arrive, but when. However, it is near to impossible to precisely predict the timing; in other words, it is very hard to find out when asset prices reach the highest level and start to decline.

In Text Box 4 we summarize the main causes and factors that contributed to the latest financial crisis and their consequences. A hypothetical "if not" scenario is added trying to figure out what would (probably) happen in the absence of a particular factor (naturally, it is of a highly speculative nature).

Text Box 4: **The Main Causes and Consequences of the Financial Crisis**

The main causes and factors that contributed to the crisis	**The consequences**	**The "if not" scenario – the likely consequences in the absence of the given factor**
Non-recourse mortgages secured just with the house as collateral – borrowers had no personal liability for the debt. The possibility of non-recourse default on mortgage debt without risking a deficiency judgment was an American specialty; in all other advanced economies, mortgage loans are recourse.	**Declining prudence** on the borrowers' side. Too many risky loans with high LTV that on long-term are unaffordable. Widespread negative equity after house prices started to fall. Very high – internationally unprecedented – delinquency and foreclosure rates. Resulting huge losses for the mortgage lenders, guarantors, insurers and holders of mortgage related securities and derivatives.	**More cautious and prudent borrowers**, smaller amount of risky loans on the market, lower average LTV and smaller number of mortgages with negative equity. Resulting lower delinquency and foreclosure rates and smaller losses for the mortgage financing industry. But also higher losses for irresponsible households and a higher danger of predatory lending.
Government housing policy which by various means **supported the increase in lending to low and medium income households** (including risky subprime and Alt-A loans). FHA insurance, securitization and explicit or implicit guarantees by Ginnie Mae or GSEs (Fannie Mae and Freddie Mac), Affordable Housing Goals set by the HUD for the GSEs and CRA requirements for some mortgage lenders.	**Grand-scale moral hazard** as there was a huge market where lenders could sell or insure their loans (including risky subprime and Alt-A mortgages) to government and semi-government enterprises passing credit risk on to the state. Also, investors could buy mortgage backed securities explicitly or implicitly guaranteed by the government. Government intervention creates strong incentives to issue risky loans and to buy securities created from these loans. The costs for taxpayers (mainly because of the bailout of the two GSEs) are huge.	**A smaller supply of risky loans** (from primary lenders) **and smaller demand for securities** (MBS) **created from these loans** (and guaranteed) by Ginnie Mae, Fannie Mae and Freddie Mac. The quality of mortgages probably would not have declined so much. The losses from delinquencies and foreclosures would have been lower, resulting in smaller losses for government and semi-government institutions, and thus lower costs for taxpayers.

The main causes and factors that contributed to the crisis	The consequences	The "if not" scenario – the likely consequences in the absence of the given factor
True-sale **securitization is the main source of funding for mortgages**. Prior to the crisis, the US became the first country in the world where the majority of housing finance funding came from capital markets (referred to as the *originate to distribute model*) instead of the traditional depository-based funding (referred to as the *originate to hold model*). Prior to the crisis, the majority of the outstanding residential mortgages (but over 80 percent of newly issued mortgages) were securitized in America. In sharp contrast to the European practice (issuing covered bonds), the mortgage loans were removed from the balance sheets of financial institutions, and MBS investors had no claim vis-à-vis the originator (the bank), just against the collateral (the house of the borrower).	**Declining prudence on the side of primary lenders**. By selling mortgage loans lenders could pass credit risk to holders or guarantors/insurers of mortgage backed securities. Securitization created a chain of risk transfer from original mortgage lenders to MBS investors and insurers. Unprecedented degradation in the quality of mortgage loans followed. The majority of financial intermediation migrated outside the traditional banking system to the fragile, opaque and interconnected shadow banking system. Rising delinquency and foreclosure rates lead to a chain reaction, a regional problem in the American housing market – through the channels of financial innovation (securitization) – threatened to tear down the whole global financial system. Huge losses by financial firms and costly government bailouts followed.	**Less risky and more prudent lending policies of primary lenders**. If it is not possible to sell the loans, or if in the case of securitization the lenders issuing mortgage bonds have to keep mortgages on their balance sheets and remain liable for the bonds (like in the case of European covered bonds), primary lenders are not in a position to pass on credit risk. They will control the ability of the borrowers to repay the loans much more than they did. The quality of mortgages probably would not decline so much. The losses from delinquencies and foreclosures would have been lower and they would not spread to the whole financial sector (rather they stop inside mortgage finance). Problems in American housing finance probably would not have triggered a global crisis.
Failed regulation of the financial sector. A too high leverage (reverse of the ratio of equity capital to assets) was allowed (especially in the shadow banking system) for Government Sponsored Enterprises (GSEs), banks, broker-dealer and asset management subsidiaries and off-balance sheet entities (conduits, SPVs and SIVs) of large financial holding companies and investment banks. Some market segments, for example over-the-counter (OTC) derivatives like credit default swaps (CDS), were not regulated at all and there were no capital or reserve requirements for these products.	Less regulated, more fragile, opaque and very much interconnected **shadow banking** operating with increasing and very high leverage significantly **surpassed** the (safer, more stable and better regulated) **traditional banking system. Many of its actors became "too big to fail".** Taking ever increasing risks resulted in colossal losses, eating up quickly the relatively small equity capital. Many times (because of the interconnected actors and systemic risk they posed) government bailouts followed with high costs for the taxpayers.	**Higher equity capital to absorb the losses**, a lower amount of taxpayer money needed for bailouts. If there was more shareholders' equity at risk, probably financial institutions would have also followed less risky investment strategies. There would be less shadow banking when it is regulated like normal banking. The same applies for the over-the-counter (OTC) derivatives market if it is regulated (and consequently capital adequacy ratios are required by regulators).
Lax monetary policy of the Fed which kept interest rates too low for too long (ignoring inflation targeting and for some time even actual inflation).	**Strong increase in money supply**, cheap credit flowing to the economy and a resulting **credit expansion and property market bubble**.	**The credit and housing bubble probably would have been smaller**.

The main causes and factors that contributed to the crisis	The consequences	The "if not" scenario – the likely consequences in the absence of the given factor
Rising external imbalances of the American economy: increasing current account deficits, huge capital import from the rest of the world.	The additional funds flowing to the economy **increased and prolonged the debt-driven boom cycle**, enabling America to live far beyond its means for longer. The influx of foreign capital kept interest rates low, enabling cheaper borrowing.	**The credit and housing bubble probably would have been smaller**. High fiscal deficits and monetary tightening by the Fed (from 2004) would have resulted in higher interest rates (also for mortgages). This might have pricked the housing bubble earlier.
Rising inflow of cheaper foreign goods and immigrant labor.	**Consumer price inflation remained relatively low** both in the case of tradable (cheaper foreign goods) and non-tradable (cheaper immigrant labor) goods.	**Consumer price inflation** – as well as wage increases – **would have been higher**, forcing the Fed to tighten monetary policy earlier and more aggressively. This might have pricked the housing bubble earlier.

In the future – to minimize the possibility of similar crises developing – mortgage finance and the whole financial system should be built on principles like prudence, liability, responsibility, transparency and incentives toward conservative risk aversion strategies for all the players from Wall Street to Main Street. When trying to prevent another similar crisis from developing, decision makers should consider the following (more specific) measures:

Abolishing American non-recourse mortgages

Decision makers in the United States should seriously consider a radical change in the character of mortgage finance; first and most importantly, it seems to be necessary to introduce full-recourse mortgage loans instead of non-recourse ones. The missing liability of borrowers resulted in a massive wave of delinquencies and foreclosures in America. Mortgage loans were recourse in all other developed countries and foreclosure rates remained well below the American levels everywhere. Without making the loans recourse and thus reintroducing personal liability for the loans, it is hard to imagine how to increase the prudence of US borrowers, which declined sharply prior to the crisis. Other steps should be considered as well: it is possible to forbid second and third mortgages, to maximize LTV ratios at some reasonable level (at 80 % for example), to forbid (initially very favorable) "teaser rates" and also to establish minimum requirements for borrowers (like loan to in-

come ratios, FICO-scores measuring creditworthiness and documentation of income and assets). It means ending with subprime and Alt-A loans. The well-known NINJA loans (given to people with no verified income, job or assets) should never appear again on the scene. If these changes are made, it will be necessary to devote more attention to the defense of borrowers (against predatory lending) because they are going to be more vulnerable. However, many of the steps needed were already passed within various legislative measures like the Housing and Economic Recovery Act of 2008, which reformed the Truth in Lending Act (TILA), introducing the requirement that borrowers receive examples of how mortgage payments would change based on rate adjustments and information on the maximum possible payment under the loan terms (Barth et al. (2009): 252).

Banning true-sale securitization

American-style securitization was one of the major factors behind the dramatic decrease of prudence on the lender's side. It enabled primary mortgage lenders to sell the loans they had and pass on the credit risk (to the next actor in the securitization chain). To reintroduce sound and prudent lending practices securitization should be limited to the European-style issuance of covered mortgage bonds. By issuing these bonds, lenders can collect the (long-term) capital necessary for financing the mortgages but – contrary to the previous practice – they should keep the mortgage loans on their balance sheets and should remain liable for the bonds they issued. In an ideal case, the bondholder will hold a threefold claim: first against the bank, second, if the bank goes bankrupt, against the bank's mortgage debtor (assuming that the loans are recourse), and third, if the debtor files for personal bankruptcy, against the real estate. Prior to the crisis, the holders of American mortgage backed securities had a claim just against the real estate (the collateral) itself. The role of second and third rounds of securitization – creating collateral debt obligations (CDOs) from MBS and other asset backed securities, or CDOs from CDOs – was seriously questioned by the crisis. This type of financial alchemy had no value added for society but played a key role in spreading and multiplying the crisis and creating the opaque and interconnected network of shadow banking which became too big and too interconnected to fail. Therefore, it makes sense to limit securitization to one single round of the issuance of the above described covered bonds.

Decreasing leverage, increasing equity capital (of banks)

The financial sector (especially shadow banking) became so fragile prior to the crisis because of increasing leverage or, in other words, very low and decreasing equity capital relative to its assets and liabilities. This reduced the liability of financial corporations to dangerously low levels. Sinn (2010: 71) praises the principle of limited liability as capitalism's secret of success (a necessary and beneficial legal concept) but argues that prior to the crisis it was expanded so much by many financial firms that in the end they were hardly liable at all.

"The disaster happened because the bacillus of limited liability, non-recourseness, and irresponsibility spread throughout the world, infecting the financial markets without the regulatory bodies doing anything to stop it. Banks, hedge funds, special purpose entities, investment funds, and real-estate financiers were able to do business almost without any equity. Those having no equity are not liable, and if not liable, they feel free to gamble. They will look for risk wherever it can be found, because they can privatize the profits and socialize the losses." (Sinn (2010): 260)

One of the key lessons of the crisis is that it is absolutely essential to increase the equity capital of banks (i.e. all financial institutions) to restore liability, prudence and responsibility. Shareholders risking more of their own equity capital (and less the money of others) will have stronger incentives for risk aversion. The gradual implementation of the Basel III package is certainly a step in the right direction because it will increase the mandatory minimal (equity) capital requirement for banks.[53] The problem is that it still prescribes the level of core capital relative to risk-weighted assets (called Tier-1 capital), which still should be calculated from the different risk assigned to various assets in a complicated way. (It is well known that in the past the best AAA ratings indicating the lowest credit risk were assigned to tranches of securities and government bonds which were later quickly downgraded to junk status.)

53 The minimum Common Equity Tier 1 and Tier 1 requirements will be phased in between 1 January 2013 and 1 January 2015. On 1 January 2015, banks will have to meet the 4.5 % Common Equity Tier 1 and the 6 % Tier 1 requirements. The total capital requirement remains at the existing level of 8.0 % and so does not need to be phased in (Basel Committee on Banking Supervision (2010): 28).

The crisis showed clearly that it is very hard to find out which types of assets are riskier than others. In the future, it would be better to avoid these problems by simply putting one absolute capital ratio relative to total assets. Weighting the risk and categorizing all the assets is very much complicated and opens the doors for bypassing the rules, however specific they are. In the future, regulators should rather be cautious with very detailed, "super-specific" regulation because there are no such specific rules that can not be circumvented and it is next to impossible to keep pace with financial innovation. Therefore, general simple rules applied across the board (for small, big and shadow banks altogether) are probably the best solution to ensure reasonable capital adequacy and avoid regulatory arbitrage. Absolute maximum leverage (let's say, 1 to 10 or 12) and a minimal capital ratio (around 10 percent) is required, and not risk weighted requirements (Roubini – Mihm (2010): 214).

Shadow banks should be treated and regulated like banks

Considering the colossal losses and the staggering bill of bailouts (e.g. Fannie Mae, Freddie Mac and AIG), it is time to treat and regulate shadow banks (including special off-balance sheet entities) as normal banks, including maximum leverage ratios and minimum capital requirements. The rule is simple: if it looks like a bank, regulate it like a bank. This can make regulatory arbitrage meaningless and is likely to limit moral hazard and the "too big to fail" problem.

Abolish mere betting and gambling, like "naked" CDS and "naked" short sales

Over the counter (OTC) derivatives, mainly credit default swaps (CDS) played an important role in spreading the crisis and multiplying its effects. They also contributed to the dramatic increase in moral hazard which resulted in very high socialized losses for the taxpayers (the bailout of the major CDS seller AIG, which became too big and too interconnected to fail). A universally agreed character of insurance is that one can only insure what one actually owns. Contrary to this, a naked CDS purchase means that somebody takes out insurance on securities without actually owning them, which is essentially nothing else than speculative betting. "*Worse, anyone who had placed a bet that someone would default had every incentive to make this happen. In these cases, purchasing a CDS was akin to buying homeowners' insurance on a house that you didn't actually own – and then trying to set fire to it*" (Roubini – Mihm (2010): 199). Therefore, naked CDS should be banned, reducing CDS contracts to real insurance available for hedging only and not for speculation – these remaining CDS contracts should be dealt via a clearing house (similarly to financial futures) and – to reduce risks and moral hazard further – CDS sellers should hold capital backing similar to commercial bank capital adequacy ratios (Buckley (2011): 283 and Roubini – Mihm (2010): 201 – 202).

Regulators should also consider the ban on naked short sales or even all short sales. Short sales in principle destabilize the market by creating downward (when selling the borrowed shares) and upward (when repurchasing the shares) pressures that would not have existed in the absence of short sales (Sinn (2010): 288). In the case of naked shorts, the "seller" does not even borrow the shares. Shorts provide a massive market force to manipulate prices for a group of investors speculating on price decreases. In the absence of shorting they still would be able to make profit with forward sales but without the ability to massively manipulate prices (ibid.). Therefore, the ban on short selling or at least naked short selling is another possibility for legislators to stabilize markets (temporary bans on shorts were repeatedly introduced by several authorities during the crisis).

Limit moral hazard created by government intervention; abolish Ginnie, Fannie, Freddie, FHA insurance, affordable housing goals and CRA requirements

Government incentives aimed at increasing home ownership rates in America (especially within lower and middle income groups and minority communities) created a grand-scale problem of moral hazard. Various actors could pass on the credit risk to the government and this resulted in a staggering cost for taxpayers. Primary lenders could sell the junk loans they made to the GSEs (Fannie Mae and Freddie Mac) or insure them at FHA and sell them to Ginnie Mae. Investors could buy MBSs created from these loans with guarantees given by these agencies explicitly or implicitly backed by the US government. This resulted in massive gambling where the gains were privatized and losses nationalized. To make things worse, Fannie Mae and Freddie Mac were allowed to operate with the highest leverage ever allowed for any financial institution. In principle, the federal government (basically any government) should not purchase, insure, securitize and guarantee mortgages or any mortgage related securities. The aims of social policy (regardless of how noble they are) should not be mixed with mortgage lending standards and financial regulation. Rather traditional, direct and simple measures (like supporting social housing, limited indirect help through some existing tax incentives) are needed that are transparent in costs for society and do not create hidden implicit deficits in public finances.

The government also should concentrate on ensuring the high quality and soundness of mortgage loans and not taking a leading role in the industry-wide degradation of lending standards, continuously decreasing the underwriting criteria (as it happened prior to the crisis). Therefore, policies like CRA requirements and affordable housing goals should not exist. The government should not tell the financial institutions which mortgage they are supposed or not supposed to buy. This can be very dangerous, as many politicians would give loans to everybody (i.e. to every potential voter) in a drive for popularity.

Change the incentives of shareholders and managers

Prior to the crises in the financial sector (especially shadow banking), short-term profit maximization was the strongest incentive for leading managers and for many shareholders. Managers were awarded with fat bonuses (in the case of leading traders and

bankers, usually higher than base salaries), and shareholders with fat dividends resulting from high returns on equity (made possible because of very low equity to asset ratios). Therefore, they took ever increasing risks and gambled regardless of the possible negative long-term consequences. Something has to be done with the bonuses encouraging risk taking and excessive leverage. One possibility is to compensate (apart from the base salary) traders with restricted shares in the firm (shares which have to be held a certain amount of time before they vest); these shares then could be sold just after, let's say, 5 or 10 years or even a longer time (Roubini – Mihm (2010): 186). This way traders and bankers would have the long-term health of the company also in mind. Another possibility in the case of traders is to create long-term bonus accounts (ibid. 188). In the case of bets that are paying off for the firm, bonuses are flowing into this account, but in the case of bets generating losses, money is deducted from the existing account. Traders are going to be awarded according to their long-term performance; their employers will average their performance over the course of several years and pay bonuses (if there are any) from the bonus account only after this period. Regulators might also consider the introduction of caps and taxes on bonuses. The most important thing is to apply the rules across the board for all financial institutions (which is possible only when the government is going to put the new rules into effect). Regarding the shareholders, the most effective tool was already mentioned above: increasing the level of mandatory equity capital. This by nature encourages a stronger risk aversion as shareholders have more of their own money at stake (and are risking the money of others to a lesser extent). The higher the required minimum equity capital (or lower the leverage allowed), the stronger are the incentives for shareholders to avert excessive risk.

A better regulatory system in America

The US legislators should consider the consolidation of the many regulatory agencies to one single body (of course, with many subdivisions) with a clear hierarchy and an ultimate responsibility for addressing systemic risk. This single regulator (which could be within the central bank, but not necessarily so) would have all the information to monitor systemic risk and to take coordinated action throughout the financial system. Furthermore, assuming that these universal rules are applied as proposed above, regulatory arbitrage would be meaningless.

The policy proposals indicated above are certainly not exhaustive; they rather form a minimum set of needed measures when trying to avoid a similar crisis from developing. On the other hand, the various steps are amplifiers; the more of them are adopted, the higher are the chances for success. On the contrary, if only one or a few measures are implemented (and the others watered down or not even tried), the results are likely to be insufficient, leading to contradictory results. In the era of extremely complex and interconnected financial sectors, only a complex set of measures could be a feasible solution to the problems, or, better to say, to most problems that resulted in the last financial crisis. One has to acknowledge that to prevent all financial crises from happening is a mission impossible even if all the proposed changes are fully implemented. Periodically arriving crises posed a persistent threat to economic development throughout history and it would be naive to think that it is possible to eliminate them forever. But this is not to say that we should resign from improving things based upon past experience. This book was written to contribute to the discussion of this experience, helping to understand the past and learn from it so that the same mistakes are not repeated in the future.

Annex: Glossary

ABCP	**Asset-backed commercial paper**. Debt securities created through **securitization** similar to **ABS**, but they have an original term to maturity of one year (270 days) or less. ABCP may be backed by residential mortgages, but also by short-term trade receivables, auto, equipment or margin loans or leases.
ABS	**Asset-backed securities**. Debt securities created through **securitization** that typically have an original term to maturity of more than one year, and are usually backed (collateralized) by assets (credit card debt, student or auto loans, leases and mortgages). They include mortgage-backed securities (**MBS**). ABS and ABCP are classified as debt securities because the security issuers are required to make payments, while the holders do not have a residual claim on the underlying assets; if they did, the instrument would be classified as either equity securities or investment fund shares.
Affordable housing goals	**Goals** originally **set by the Department of Housing and Urban Development** (later by the Federal Housing Finance Agency) **for Fannie Mae and Freddie Mac** to allocate a specified part of their mortgage business **to serve low- and moderate-income borrowers**.
Appraisal	A written estimate of a property's current market value, prepared by a licensed professional. Lenders require appraisals as part of the loan approval process, and the fee is usually charged to the buyer at closing.
Basel II	An accord providing a comprehensive revision of the Basel capital adequacy requirements issued by the Basel Committee on Banking Supervision (BCBS – an international committee of bank supervisors that meets under the auspices of the Bank for International Settlements, Basel, Switzerland) in 1988 (Basel I). These international banking regulations aim to minimize credit risks by setting out the minimum capital requirements of financial institutions and have been adopted by more than 100 countries including the United States. Pillar I of the accord covers the minimum capital adequacy standards for banks; Pillar II focuses on enhancing the supervisory review process and Pillar III encourages market discipline through the increased disclosure of banks' financial conditions.
CDO	**Collateralized debt obligation (CDO):** A structured debt instrument backed by the performance of a portfolio of diversified securities (**ABS**), loans or credit default swaps, the securitized interests of which are divided into tranches (based on risk) with differing streams of redemption and interest payments. When the tranches are backed by securities or loans, the structured instrument is called "cash" CDO. Where it is backed only by loans, it is referred to as a collateralized loan obligation (CLO) and when backed by credit default swaps, it is a "synthetic" CDO. Creating a CDO represents a second round of **securitization** or "re-securitization" when already existing products of securitization (mostly ABS) are repackaged, transformed into a CDO and sold to investors.
CDS	**Credit defaults swaps** (CDS) are financial instruments used as a hedge and protection for debt holders from the risk of default. CDS is designed to transfer the credit exposure of fixed-income products between parties. The buyer of a credit swap receives credit protection, whereas the seller of the swap guarantees the creditworthiness of the product. The buyer of the swap makes periodic payments to the seller in return for protection against a possible default affecting the value of a specified asset (mostly corporate bonds, **ABS** and **CDO**). The seller agrees to buy these assets from the buyer at par in the event of credit default. By doing this, the risk of default is transferred from the holder of the fixed-income security to the seller of the swap.
Conduit	A financial intermediary, such as a **special-purpose vehicle** (**SPV**) or a **special investment vehicle** (**SIV**), which funds the purchase of assets through the issuance of asset-backed securities such as MBS or commercial paper.
Collateral	An asset that is pledged as security for a loan. The borrower risks losing the asset if the loan is not repaid according to the terms of the loan agreement.

CRA	**Community Reinvestment Act:** A federal law from 1977 encouraging *depository institutions* to make loans and provide services in the local communities in which they take deposits.
Credit crunch	A situation when banks become so suspicious of the creditworthiness of other banks that stop lending to one another.
Credit rating agency	Private company that evaluates the credit quality of securities and provides ratings on those securities; the largest are **Fitch Ratings**, **Moody's Investors Service**, and **Standard & Poor's**.
Current account balance	The amount of a country's total export of goods and services plus interest and dividend payments exceeds (surplus) or falls short (deficit) of its total imports of goods and services plus interest and dividends.
Deficiency judgment	A legal process where a mortgage lender is seeking the difference between the value of the loan and the foreclosed property of a defaulted borrower. If the value of the outstanding loan is higher than the (fair market) value of the property (e.g. the actual **LTV** is over 100 % or, in other words, the borrower was in **negative equity**), the gains from selling the collateral (property seized in a **foreclosure** procedure) cannot cover the loss on the loan (plus the legal costs). If deficiency judgments are available, lenders can seize the borrower's other assets or income to compensate their losses. Borrowers are personally liable for the loan; it is not secured just by the collateral. The unique feature of most of the US mortgage market was its de jure or de facto **non-recourse** character, deficiency judgments were either prohibited or costly, time consuming, limited or complicated and were thus seen as ineffective in most states.
Derivative	Financial contract whose price is determined (derived) from the value of an underlying asset, rate, index, or event.
DTI	**Debt-to-income ratio.** The ratio of monthly total debt payments (mortgage, real estate tax payments, credit card, etc.) to monthly income. A measure of the ability of the applicant to make monthly payments.
Equity	The owner's level of ownership in a home. It is calculated as the difference between the current market value of the home and the balance of outstanding mortgage loans.
Fannie Mae	**Federal National Mortgage Association** (nicknamed Fannie Mae), a Government-sponsored enterprise (GSE) created in 1938 under the authority of the National Housing Act of 1934 as a government agency to help finance the mortgage lending industry after the wave of bank defaults in the Great Depression. Its function was to expand the availability of residential mortgage finance by buying mortgages from originators. These purchases were funded through debt issuances that were direct obligations of the federal government. As part of the Housing and Urban Development Act of 1968, Fannie Mae was spun off from the federal government and became a publicly traded corporation (the main reason for this was to remove its debt from the federal government's national debt obligations). However, its main purpose remained unchanged and it continued to have a special status as a GSE.

FHLB, FHLBS	**Federal Home Loan Banks/Bank System,** a Government-sponsored enterprise (**GSE**). Created by the **Federal Home Loan Bank Act** of 1932 and styled after the Federal Reserve System, it has 12 district Federal Home Loan Banks, which are supervised by the Office of Thrift Supervision. The primary purpose of its creation was to increase the amount of funds available to local financial institutions that supplied home mortgages (community banks, thrifts, commercial banks, credit unions, community development financial institutions and insurance companies and state housing finance agencies are all eligible for membership in the System). To become a member of an FHLB Bank, a financial institution must purchase stock in the FHLB System. The stock is held at par value and not traded. The FHL Banks are entirely privately owned by these member-owners. The FHLBS, like the Fed, makes loans to the members of the system (obtaining funds for this purpose by issuing bonds). However, in contrast to the Fed's discount loans, which are expected to be repaid quickly, the loans from the FHLBS often need not be repaid for long periods of time. Starting from the 1970s and 1980s as a consequence of the Saving and Loans Crisis – which effectively made the FHLB System bankrupt – and the rising importance of **securitization**, the role of FHLB members in mortgage funding based on the traditional (originate to hold) model of housing finance gradually decreased.
FICO score	A numerical industry-wide used **rating of the credit history of individuals**, developed by the Fair Isaac Corporation. It represents the creditworthiness of a person: the higher the score the more likely the person will pay his or her debts in a timely manner. A credit score is primarily based on credit report information. Usually mortgage borrowers had the following FICO scores at the time of origination: **Prime** mortgages (660 and above), **Alt-A** mortgages (620 to 659) and **Subprime** mortgages (below 620).
Foreclosure	The legal process through which a lender acquires possession of the property securing a mortgage loan when the borrower defaults. By seizing the mortgagor's property the lender tries to recover the unpaid debt.
Freddie Mac	**Federal Home Loan Mortgage Corporation** (nicknamed Freddie Mac), a Government-sponsored enterprise (GSE) created in 1970 as a government agency to expand the availability of residential mortgages (at the beginning primarily in California) mainly through the securitization (issuance of MBS) of mortgages purchased from S&Ls (Savings & Loans institutions). Until 1989 Freddie Mac was owned solely by the twelve banks of the Federal Home Loan Bank (FHLB) system and by the S&Ls' members of the FHLB system; then it became a publicly traded company like Fannie Mae, but its main purpose remained unchanged and it continued to have a special status as a GSE.
FVA	**Fair value accounting.** The use of an actual market price to establish the balance sheet amount of some assets and liabilities.
GSEs	**Government-sponsored enterprises** – the Federal National Mortgage Association (**Fannie Mae**), the Federal Home Loan Mortgage Corporation (**Freddie Mac**) and Federal Home Loan Banks (**FHLB**). Fannie Mae and Freddie Mac: these two dominant entities in the secondary residential mortgage markets of the United States were issuing and guaranteeing mortgage-backed securities (MBS) and investing in mortgage assets. Mortgages that fit certain rules – like the loan limit, a LTV ratio below 80 % and full income documentation – (these are called conforming mortgages or prime mortgages) can be sold to Fannie or Freddie. The GSEs then package together a geographically dispersed group of mortgages, transform them to mortgage-backed securities (**MBS**) and sell them in financial markets.

GSEs	Fannie and Freddie were unique enterprises: their shares were traded on the New York Stock Exchange as the shares of any "normal" publicly-traded corporation, but they were created by the US Congress as government entities (and only later privatized) and thus held special federal charters guaranteeing their special status (advantages and limitations). The agency MBSs were seen by investors as essentially credit risk-free for various reasons: 1. The conforming (prime) mortgages guaranteed or bought by GSEs respected strict underwriting standards. 2. Fannie Mae and Freddie Mac provided a guarantee that investors in their MBS would receive timely payments of principal and interest (if the borrower for one of the underlying mortgages fails to make his payment, the GSE that issued the MBS will pay it instead of him). 3. The securities issued by the GSEs benefited from the implicit backing of the federal government. Consequently, the interest rates of GSE-purchased loans and issued MBSs were lower than others. By 2008 the two GSEs owned or guaranteed about half the total outstanding US residential mortgages and they were the largest and second-largest issuers (and guarantors) of MBS in the United States. In 1992 the Congress created a single regulator, called the Office of Federal Housing Enterprise Oversight, within the Department of Housing and Urban Development (HUD) to oversee Freddie Mac and Fannie Mae. On 7th September 2008 the Federal Housing Finance Agency (FHFA) placed Fannie Mae and Freddie Mac into government conservatorship (de facto nationalizing them).
Ginnie Mae	**Government National Mortgage Association** (nicknamed Ginnie Mae), a government entity within the Department of Housing and Urban Development (HUD), created in 1968 to replace Fannie Mae in guaranteeing the MBS that represent claims on pools of mortgages that are insured by the Federal Housing Authority or the Veterans Administration (FHA/VA mortgages). Ginnie Mae securities have been the only mortgage-backed securities (MBS) explicitly guaranteed by the US government. Therefore, they are considered to be the safest and enable the lowest interest rates on mortgages.
Hedge fund	A privately offered investment vehicle exempted from most regulation and oversight; generally open only to high-net-worth investors.
Hedging	An investment strategy designed to reduce or eliminate certain specified risks.
Home retention actions	Loan modifications (contractual changes in the terms of mortgages with respect to interest rates, maturity, principal or other terms of the loan), trial period plans and payment plans that allow borrowers to retain ownership and occupancy of their homes while attempting to return the loans to a current and performing status.
Leverage	The **ratio of a company's debt to its equity**, i.e. to that part of its total capital that is owned by its shareholders. High leverage means a high degree of reliance on debt financing. The higher a company's leverage, the more of its total earnings are absorbed by paying debt interest and the more variable are the net earnings available for distribution to shareholders. In other words leverage is a measure of how much debt is used to purchase assets; for example, a leverage ratio of 5:1 means that $5 of assets were purchased with $4 of debt and $1 of capital.
Leveraged buyout (LBO)	The acquisition of one company by another through the use of primarily borrowed funds, the intention being that the loans will be repaid from the cash flow generated by the acquired company.
Liar loan	An industry term for a low- or no-documentation loan, typically Alt-A or subprime, where there is a suspicion the borrower, mortgage broker or loan officer may have fraudulently overstated the income and/or assets to qualify for a larger loan. These loans are typically "stated income" or "stated asset" loans, where the lender does not verify the income and instead records income based on the borrower's verbal statement.
LIBOR index	An index used to determine interest rate changes for certain ARM plans, based on the average interest rate at which international banks lend to or borrow funds in the London interbank market.
Lien	The lender's right to claim the borrower's property if the borrower defaults. If there is more than one lien, the claim of the lender holding the first lien will be satisfied before the claim of the lender holding the second lien.

Liquidity	A liquid asset is one that can be converted easily and rapidly into cash without a substantial loss of value. Liquidity is sometimes defined as a firm's ability to acquire money whenever it is needed in large and highly variable sums.
LTV	**Loan-to-value (ratio).** The amount of mortgage loan borrowed divided by the market value of the house used as collateral. LTV is the complement of the percentage of down payment paid in purchasing a house.
MBS	**Mortgage-backed security**. A type of **ABS** created in a process called **securitization**, where a great number of variable quality and geographically diversified mortgage loans (pool) are packed together, transformed into mortgage-backed securities and sold to financial investors. Under this new financial market-based housing finance funding model (also referred to as the originate-to-distribute model) the originators sell the mortgages to large financial institutions, these transform them into securities and sell them to investors. The cash flows from mortgages (interest and principal payments collected by the servicer–originator) are transformed into the cash flows of securities paid to their holders by the security issuer – usually a GSE or a SPV (conduit) of a large financial institution.
Monoline	An insurance company (for example Ambac or MBIA) that specializes in insuring the performance of financial instruments (its single line of business is to guarantee financial products), originally municipal debt but later also mortgage backed ones. Most Monolines offered insurance of private-label **MBS**. Many also insured AAA-rated portions of **CDO**s.
Moral hazard	The situation that arises when a person or institution is totally insulated from risk and, consequently, has no incentive to prevent such a risk.
Mortgage	A legal contract between a lender and a borrower involving a loan secured by a lien on some specified real estate property.
Mortgage insurance	Insurance against default required by lenders for borrowers with an LTV ratio greater than 80 percent. The amount insured will be some percentage of the loan and may decline as the LTV ratio declines.
Mortgage servicer	Company that acts as an agent for mortgage holders, collecting and distributing payments from borrowers and handling defaults, modifications, settlements, and foreclosure proceedings.
Mortgagor	The mortgage borrower who mortgages his property to secure a mortgage loan.
Negative equity	A situation when the combined value of mortgage loans is higher than the actual market value of the house, serving as collateral for the loans (in other words the combined **LTV** is more than 100 percent). Negative equity is also referred to as being "underwater" or "upside down". Borrowers usually owe more on their mortgage than their homes are worth because of a decline in value, an increase in mortgage debt or a combination of both.
Refinancing	**Prepayment** of an existing mortgage by replacing it with another mortgage, typically under more favorable terms. Refinancing can be undertaken to reduce the interest burden (monthly payments) on the mortgage by refinancing to a lower interest rate, switching to a longer-term loan, switching from one product type to another (like switching from an ARM to FRM) and by extracting a homeowner's equity (cash-out refinancing). The possibility to repay a mortgage early without penalty encouraged households to take out mortgages with terms that looked good in the short term, but were unfavorable in future years. They expected to refinance later on better terms (hoping that house price appreciation would continue) and without incurring a pre-payment penalty.
Repo	**Repurchase agreement:** a method of secured lending where the borrower sells securities to the lender as collateral and agrees to repurchase them at a higher price within a short period, often within one day.
RWA	**Risk-weighted assets.** A bank's assets weighted according to perceived credit risk. Thus, corporate loans for example would have a higher risk rating than AAA-rated securities (or tranches of these securities) or government bonds.

Securitization	The **process of transformation of various loans to debt securities** (mostly to **ABS** – asset backed securities), which are sold to financial investors. The issuer of these securities sells to investors the rights to principal and interest payments made by borrowers on pools of loans. Securitization results in debt securities for which coupon or principal payments (or both) are backed by specified financial or non-financial assets or future income streams (including, among others: residential and commercial mortgage loans, consumer loans, corporate loans, government loans, credit derivatives and future revenue). **Securitization** is basically transforming otherwise illiquid financial assets (such as residential mortgages, auto loans, and credit card receivables), which have typically been the bread and butter of banking institutions, into marketable capital market securities. The financial institution selling the securitized loans makes a profit by servicing the loans (collecting the interest and principal payments and paying them out) and charging a fee to the third party for this service. Securitization schemes can be grouped into three broad types: 1. **On-balance sheet securitization**, in which the original asset owner creates new debt securities; that is, there is no securitization corporation and no transfer of assets. The assets remain on the balance sheet of the debt securities issuer (the original asset owner) typically as a separate portfolio. 2. **True-sale securitization** involves debt securities issued by a securitization corporation where the underlying assets have been transferred from the original asset owner's balance sheet. The income stream from the pool of assets (typically interest payments and principal repayments on the loans) is used to make the coupon payments and principal repayments on the debt securities. 3. **Synthetic securitization** involves the transfer of the credit risk related to a pool of assets without a transfer of the assets themselves. The original asset owner buys protection against possible default losses on the pool of assets using credit default swaps (**CDS**). The proceeds from the issue of debt securities are placed by a securitization corporation on deposit, and the interest accrued on the deposit, together with the premium from the CDS, finances coupon payments on the debt securities.
Shadow banking	Refers to bank-like financial activities that are conducted by unregulated or lightly regulated institutions outside the traditional banking system without access to central bank liquidity or (explicit) public sector credit guarantees. These institutions included **GSE**s, off-balance sheet entities of commercial banks (e.g. **SPV**s and **SIV**s), investment bank holding companies (also referred to as diversified broker dealers) and other entities (stand-alone and captive finance companies, limited purpose finance companies, credit hedge funds, mortgage insurers, monolines and certain subsidiaries of large and diversified insurance companies).
Short selling	Borrowing shares and selling them now with the expectation of a fall in price enabling them to be bought back at a lower price to create a profit. A "naked" short sale is an unhedged position.
SIV	**Structured investment vehicle.** A leveraged **special-purpose entity** that undertakes arbitrage activities by purchasing mostly highly rated medium- and long-term fixed-income assets (ABSs, CDOs) and that funds itself with cheaper, mostly short-term highly rated commercial paper and medium-term notes (MTNs). While there are a number of costs associated with running a structured investment vehicle, these are balanced by economic incentives: the creation of net spread to pay subordinated noteholder returns and the creation of management fee income.
SPV	**Special-purpose vehicle (or entity).** A legal entity (corporation, limited partnership or other) set up to fulfill a narrow objective (isolate risk, realize tax benefits, enjoy regulatory or bankruptcy advantages). SPVs were used to acquire and hold certain assets (mortgages, ABSs) on their balance sheet and to issue securities backed by those assets for sale to third parties.
Swap	A derivative in which two parties agree to exchange a series of cash flows at agreed-on intervals (settlement dates).
SWF	**Sovereign wealth fund.** A special investment fund created/owned by a government to hold assets for long-term purposes; it is typically funded from official currency reserves or other foreign-currency sources including commodity export revenues and predominantly has significant ownership of foreign currency claims on non-residents. Usually created to diversify asset portfolios and buy higher yielding (but riskier) assets than government bonds.
Systemic risk	Risk posed to the entire financial system by the possible collapse of an interconnected financial institution, or a particular financial product.

Teaser rates	Low initial rate of interest on a (mortgage) loan, which lasts for a short (two of three year) period, then rises sharply.
Thrifts	A term referring to lending institutions such as savings and loan associations (S&L), credit unions and mutual savings banks supplying home mortgages.
Too-big-to--fail	Government practices that protect large banking organizations from the normal discipline of the marketplace because of concerns that such institutions are so important to markets and their positions so intertwined with those of other banks that their failure would be unacceptably disruptive, financially and economically.
Tranche	When mortgages are securitized, the bonds created are often divided into a number of tranches (slices or portions – usually of collateralized debt obligations). Tranches are related bonds offered as part of the same transaction, where each bond is a different slice of the deal's risk. Transaction documentation defines the tranches as different "classes" of notes, each identified by letter (e.g., Class A, Class B and Class C securities). Bonds in the least risky class have first claim on the cash flow from the pool of underlying mortgages, then bonds in the next class are paid, and so on, up to the riskiest bonds, which have the residual claim. Bonds in riskier tranches typically pay higher interest.
Underwriting	The process of determining whether and under what conditions a mortgage should be made.
Underwriting standards	Standards and requirements imposed by lenders as conditions for granting loans, such as credit history, maximum ratio of expenses to income, maximum loan amounts, maximum loan-to-value (LTV) ratios, and more.
Wholesale origination	A loan origination strategy by which loans are purchased from mortgage brokers, mortgage bankers, or other lenders. This process enables a (mortgage) lender to acquire servicing rights without incurring the costs associated with running a retail origination operation.
Without recourse (non-recourse)	In most US states the mortgage contract was (de jure or de facto) **"without recourse to the borrower."** This means that if a household stopped paying on a mortgage and went into default, the lender could seize the house (the **collateral** on the loan) through a **foreclosure** procedure but could not pursue the borrower for any deficiency between the home's value and the remaining debt (remaining mortgage, selling and legal costs). The so-called **deficiency judgments** were either prohibited or costly, time consuming and thus seen as ineffective in more than half of the states. In other words, the lender cannot go after the defaulting borrower's other assets or income if the collateral (foreclosed house) is insufficient to cover the mortgage debt. In principle, this encourages households to **walk away** when they are unable or unwilling to cover a mortgage payment (the usual reason for the later is when they find themselves in **negative equity**).

Various types of mortgages	
Based on the form of repayment and interest rates:	
FRM	**Fixed-rate mortgage** loans have fixed interest rates and monthly payments for the whole period of the loan. Fixed-rate mortgages are available for 40, 30, 25, 20, 15 and 10 years.
Balloon loans	**Balloon loans** are short-term (usually for a term of 3, 5 or 7 years) fixed-rate loans that have fixed monthly payments and a lump sum payment at the end of the term. A balloon mortgage does not fully amortize over the term of the loan and therefore requires a large final (balloon) payment.
ARM	An **Adjustable rate mortgage** loan is a loan whose interest rate and monthly payments change over the period of the loan. These adjustments are based on the changes in a defined index established at the time of the mortgage loan application (usually a fixed percentage point margin is added to the index when calculating the new interest rates). These ARM indexes have been usually calculated from US Treasury bond yields, the interest rate indexes of American financial institutions (on savings, deposits, loans and mortgages), the London Inter Bank Offering Rate (LIBOR – an average of the interest rate on dollar-denominated deposits, also known as Eurodollars, traded between the banks in London, the center of the Eurodollar market) or other indexes and rates. With most ARMs, the interest rate can adjust monthly, yearly, every three or six months, or every three or five years. Most ARMs have interest rate caps to protect the borrower from enormous increases in monthly payments. A lifetime cap limits the interest rate increase over the life of the loan. A periodic or adjustment cap limits how much the interest rate can rise at one time.
Option ARM	One of the most creative mortgage products, as their name implies. After the first payment borrowers can choose from a variety of payment options and index rates offered by the lender bank each month.
Negative amortization	In this case borrowers during the initial period do not even pay the full amount of the interest of mortgage loan occurring each month, so the outstanding balance rises over time. The loan becomes negatively amortized: the monthly mortgage payment does not cover the interest due; any unpaid interest gets added to the loan balance, so the loan balance increases. However, as the principal and the added interest have to be later repaid, the monthly payments increase. Also, the borrower always has the option to pay a minimum monthly payment or the fully amortized amount due.
Hybrid mortgages	**Hybrid or Combined Mortgage loans** are the combination of fixed and ARM loans. Usually they start with fixed law initial ("**Teaser**") interest rates for two or three years before resetting to higher monthly payments.
Interest only	An "interest-only mortgage" is a bit misleading because these loans are really interest only just for an initial repayment period of a few years. During this ("**Teaser**") period the borrower pays just the interest rate of the loan but not the principal. However, after this initial period the principal also has to be repaid together with the interest.
Combo	**The combination of two loans**: a first and a second mortgage. These mortgages can be ARM or FRM or a combination of the two. Usually the reason is that in both cases the down payment reaches 20 %, so the borrowers can avoid paying private mortgage insurance. If they take only one loan, the down payment of this loan will be less than 20 % and so it needs insurance.

Based on the issuer/guarantor and the credit risk:	
FHA/VA and RHS loans	Mortgage loans issued by federally qualified lenders and insured by the **Federal Housing Administration** (FHA), **Veteran Administration** (VA) and the **Rural Housing Service** (RHS) of the US Department of Agriculture. FHA loans have historically being targeted to lower income borrowers while VA loans are only made available to current and previous members of the US armed forces (or, in certain cases, to spouses of deceased veterans). RHS loans were designed for rural residents. These loans allowed high loan-to-value (LTV) ratios, 97 % and 100 % (and so required little or no down payments), but were also considered the safest since they carried the explicit backing of the federal government and were typically purchased and securitized by the Government National Mortgage Association (**Ginnie Mae**).
Conforming	Mortgage loans to prime borrowers that conformed to the established rules and procedures set by the two major **GSEs**, **Fannie Mae and Freddie Mac** (a loan limit and LTV ratio below 80 % with some exceptions). Conforming mortgages were generally considered very safe since they respected strict underwriting standards and were usually backed by securities (MBS) issued by the GSEs which benefited from the implicit backing of the federal government. Together with FHA/VA mortgages these were often referred to as agency mortgages and together with FHA/VA and Jumbo mortgages as prime mortgages.
Jumbo	Non-agency (non-conforming) mortgage loans to prime borrowers with an original principal balance larger than the conforming limits imposed on the GSEs by the US Congress. To put it simply, these loans were too large to qualify for implicit government backing but were given to "safe" (usually wealthy) borrowers. Jumbo borrowers typically had better creditworthiness, lower LTV ratios and higher credit scores than agency borrowers. As a result, jumbo loans were often prepaid at faster rates than agency loans.
Alt-A	**Alternative-A or near prime**. Non-agency (non-conforming) mortgage loans to borrowers with a good credit score but originated on the basis of more aggressive underwriting than prime loans (a higher LTV ratio, the loan was secured by non-owner occupied property, the loan documentation was not complete or the borrower's income/assets had not been verified). Many loans with non-traditional amortization schedules such as interest only or option adjustable rate mortgages are sold into securities marked as Alt-A. As a result, Alt-A mortgages generally had a higher risk of default than prime ("A") mortgages.
Subprime	Non-agency (non-conforming) mortgage loans to borrowers with a blemished credit history (they had filed for bankruptcy, foreclosure, or had late payments on their credit reports) and/or who provided only limited documentation of their income or assets. To put it simply, they were too risky to qualify for conforming loans. These "B" and "C" loans typically had a relatively high default probability as evidenced by, for example, a FICO (credit) score of 660 or below (depending on the product/collateral) and a high LTV or debt service-to-income ratio. Subprime mortgage loans were often originated by lenders specializing in this type of business, using processes unique to subprime loans. They were considered the riskiest loans.
HEL	**Home equity lines** were types of non-agency (non-conforming) mortgage loans secured by the equity in a home, which was the difference between the market value of the home and the remaining balance on all of its mortgages. They typically required a good credit history and reasonable LTV ratios. Most HELs were de facto second mortgages because they were secured against the value of the property, just like traditional mortgage loans. They could be structured as a revolving credit loan, also referred to as a *home equity line of credit* (**HELOC**), where the borrower could choose when and how often to borrow against the equity in the property, with the lender setting an initial limit to the credit line.
Piggyback loans	Non-agency (non-conforming) mortgage loans similar to home equity loans and second mortgages usually taken at the same time as a first mortgage to avoid the purchase of mortgage insurance. If the homebuyer purchases a home with an **LTV greater than 80 percent**, the borrower may take out a second mortgage in addition to the first mortgage as an alternative to an additional down payment or **mortgage insurance.** Lenders often require mortgage insurance when the LTV ratio is greater than 80 percent.

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Timeline – the main events of the financial crisis:

2006	
28 December 2006	The US **Ownit Mortgage Solutions** files for bankruptcy.
2007	
22 February 2007	Losses at **HSBC**, the largest British bank, top $10.5 billion. The head of HSBC's US mortgage-lending business is fired.
2 April 2007	**New Century Financial**, the largest US subprime mortgage lender, files for Chapter 11 bankruptcy protection after its lenders cut off its credit lines and trading in its shares had been suspended by the New York Stock Exchange (on 12th March 2007).
3 May 2007	The largest Swiss banking group **UBS** closes its US subprime business.
22 June 2007	The major US investment bank **Bear Stearns** injects $3.2 billion into two of its hedge funds hurt by falling CDO prices.
10 July 2007	All three major credit-ratings agencies (**Fitch Ratings, Moody's** and **Standard and Poor's**) announce a review of subprime bonds.
12 July 2007	The Federal Deposit Insurance Corp. takes control of the $32 billion **IndyMac Bank** (Pasadena, CA) in what regulators call the second largest bank failure in US history.
31 July 2007	The two **Bear Stearns** hedge funds that were under stress file for bankruptcy protection.
6 August 2007	The **American Home Mortgage** Investment Corporation, one of the largest US home loan providers, files for Chapter 11 bankruptcy protection.
9 August 2007	The largest French bank **BNP Paribas** suspends three investment funds hit by the subprime crisis.
16 August 2007	Fitch Ratings downgrades **Countrywide Financial** Corporation to BBB+, its third lowest investment-grade rating, and Countrywide borrows the entire $11.5 billion available in its credit lines with other banks.
28 August 2007	German regional bank **Sachsen Landesbank** faces collapse after investing in the subprime market. It is sold to larger rival Landesbank Baden-Württemberg.
31 August 2007	US subprime lender **Ameriquest** files for bankruptcy.
3 September 2007	**IKB**, a German regional lender, records a $1 billion loss due to US subprime market exposure.
4 September 2007	The **Bank of China** reveals $9 billion in subprime losses.
14 September 2007	A run on the deposits of the United Kingdom's fifth-largest mortgage lender **Northern Rock** begins. The Chancellor of the Exchequer authorizes the Bank of England to provide liquidity support for Northern Rock.
26 October 2007	The major US mortgage bank **Countrywide Financial** reports a loss of $1.2 billion for the third quarter of 2007. This is its first loss in 25 years.
30 October 2007	The major US investment bank **Merrill Lynch** announces losses of $7.9 billion and the resignation of its CEO Stan O'Neal.
31 October 2007	**Deutsche Bank** reveals a $2.2 billion loss.
5 November 2007	The largest US bank holding company **Citigroup** announces that its $55 billion portfolio of subprime-related investments has declined in value by between $8 billion and $11 billion. The CEO, Charles Prince, resigns.

13 November 2007	**Bank of America** announces $3 billion subprime loss.
14 November 2007	British banks **HSBC** and **Barclays** report losses of $3.4 and 2.7 billion.
20 November 2007	One of the two government sponsored enterprises, **Freddie Mac** (Federal Home Loan Mortgage Corporation) reports a $2 billion loss.
27 November 2007	**Freddie Mac** and **Citigroup** raise $6 billion and $7.5 billion of capital respectively. US house prices record the largest quarterly drop in 21 years.
5 December 2007	The **New York Attorney General** sends subpoenas to major investment banks to investigate subprime mortgage securitization.
10 December 2007	The largest Swiss banking group **UBS** and British **Lloyds TSB** report $10 billion and £200m losses due to bad debts in the US housing market.
12 December 2007	The **Federal Reserve** announces the creation of the **term auction facility** (TAF), which will auction a fixed amount of funds to the banking system, initially set at $20 billion.
14 December 2007	**Citigroup** puts $49 billion worth of SIV assets back on its balance sheet.
18 December 2007	In a coordinated action of the **Bank of Canada**, the **Bank of England,** the **European Central Bank (ECB)**, the **US Federal Reserve**, and the **Swiss National Bank**, the ECB lends European commercial banks € 348 billion. The **Bank of England** makes £10 billion available to banks in the United Kingdom.
19 December 2007	As its subprime losses reach $9.4 billion, the major US investment bank **Morgan Stanley** sells a 9.9 % stake in the company.
2008	
11 January 2008	The **Bank of America** buys **Countrywide** for $4 billion after its shares plunge by 48 %. **Merrill Lynch** doubles the projection of subprime losses to $15 billion.
15 January 2008	**Citigroup** reports a $9.8 billion loss for the fourth quarter, including an $18 billion loss in mortgage portfolio.
19 January 2008	**Fitch Ratings** lowers the rating of **Ambac**, the second-largest monoline insurer after MBIA, from AAA to AA. This is the first downgrade of a large monoline.
21 January 2008	Global stock markets suffer their biggest falls since 11 September 2001.
22 January 2008	In a surprise move between regularly scheduled meetings, the **Federal Reserve** cuts the federal funds rate by 75 basis points to 3.50 % (its biggest cut in 25 years).
24 January 2008	The French bank **Société Générale** announces that it has lost € 4.9 billion due to the unauthorized activity of one of its traders.
30 January 2008	The **Federal Reserve** cuts the federal funds rate by 50 basis points to 3.00 %. Regularly scheduled auctions for the municipal debt of the state of Nevada and Georgetown University fail due to a lack of bidders and uncertainty about monoline insurers. The debt issuers are forced to pay a penalty rate.
13 February 2008	US President George W. Bush signs the **Economic Stimulus Act of 2008**. The Act provides approximately $100 billion of tax rebates to be distributed during the summer of 2008 and $50 billion of investment incentives.
14 February 2008	The largest Swiss banking group **UBS** announces a fourth-quarter 2007 loss of CHF12.4 billion ($12 billion).
15 February 2008	Problems in the auction-rate securities market continue to spread; over 1,000 auctions fail this week. Investment banks do not allow investors to withdraw funds invested in those securities.
17 February 2008	The **British** government decides to "temporarily" nationalize the struggling housing lender **Northern Rock**. A previous government loan of $47 billion proved ineffective in helping the company to recover.
28 February 2008	**AIG** announces fourth-quarter 2007 losses of $5.3 billion due to more than $11 billion of losses on its credit-default swap (CDS) portfolio.

11 March 2008	The **Federal Reserve Board** announces the creation of the **Term Securities Lending Facility** (TSLF), which will lend up to $200 billion of Treasury securities for 28-day terms against federal agency debt, federal agency residential mortgage-backed securities (MBS), non-agency AAA/Aaa private label residential MBS and other securities.
14 March 2008	The investment firm **Carlyle Capital** defaults on $17 billion of debt. The fund is leveraged more than 30:1 and invests mostly in agency-backed residential mortgage-backed securities (RMBS).
16 March 2008	The **Federal Reserve Bank of New York** announces the creation of the **primary dealer credit facility (PDCF)**, which essentially opens the discount window to primary dealers, including non-depository institutions.
17 March 2008	The **Federal Reserve** engineers the sale of the investment bank **Bear Stearns** to **JP-Morgan Chase** for $2 per share. Bear Stearns stock had been trading at $60 the previous week before a run pushed it to near insolvency. The sale price ($240 million) is less than the value of Bear's Manhattan office building. The Federal Reserve Bank of New York agrees to guarantee $30 billion of Bear Stearns assets, mostly mortgage-related. A week later (24 March) JPMorgan Chase raises its bid for Bear Stearns to $10 per share and agrees to indemnify the Federal Reserve Bank of New York against the first $1 billion of losses on the $30 billion that it guaranteed.
8 April 2008	**Washington Mutual**, one of the largest US mortgage originators, raises $7 billion from TPG, a private equity firm.
	The **IMF**'s Global Financial Stability report estimates that the total credit losses will be $1 trillion.
18 April 2008	**Citigroup** announces another $12 billion of losses related to subprime mortgages, leveraged loans, exposure to monoline insurers, auction-rate securities and consumer credit.
22 April 2008	One of the largest British banks, the **Royal Bank of Scotland** announces that it will raise about £16 billion from investors by selling assets.
30 April 2008	In the UK, the first annual fall in house prices in 12 years is recorded by Nationwide.
4 May 2008	Finance ministers of **13 Asian nations** agree to set up a foreign exchange pool of at least $80 billion to be used in the event of another regional financial crisis. **China, Japan** and **South Korea** are to provide 80 % of the funds with the rest coming from the 10 members of **ASEAN**.
6 May 2008	**UBS** AG announces a CHF11.5 billion ($11.1 billion) loss during the first quarter of 2008.
12 May 2008	Monoline insurer **MBIA** announces a $2.4 billion loss during the first quarter of 2008.
5 June 2008	Rating agency **Standard and Poor's** downgrades monoline bond insurers **AMBAC** and **MBIA** from AAA to AA.
13 July 2008	The **Federal Reserve Board** authorizes the Federal Reserve Bank of New York to lend to the Federal National Mortgage Association (**Fannie Mae**) and the Federal Home Loan Mortgage Corporation (**Freddie Mac**), should such lending prove necessary. The **US Treasury Department** announces a temporary increase in the credit lines of Fannie Mae and Freddie Mac and a temporary authorization for the Treasury to purchase equity in either GSE if needed.
15 July 2008	The **Securities Exchange Commission** (SEC) issues an emergency order temporarily **prohibiting** naked **short selling** in the securities of **Fannie Mae, Freddie Mac** and primary dealers at commercial and investment banks.
7 September 2008	The **Federal Housing Finance Agency** (FHFA) **places Fannie Mae and Freddie Mac in government conservatorship** (de facto nationalizing them). The **US Treasury Department** announces three additional measures to complement the FHFA's decision: 1) Preferred stock purchase agreements between the Treasury/FHFA and Fannie Mae and Freddie Mac to ensure the GSEs positive net worth; 2) a new secured lending facility which will be available to Fannie Mae, Freddie Mac and the Federal Home Loan Banks; and 3) a temporary program to purchase GSE MBS. Fannie and Freddie have outstanding liabilities about $5.4 trillion.

14 Sept. 2008	The **Bank of America** says it will buy the major investment bank **Merrill Lynch** for $50 billion.
15 September 2008	**Lehman Brothers,** one of the five major Wall Street investment banks, goes into bankruptcy at $639 billion, which is the largest in the history of the United States.
16 September 2008	The **Federal Reserve Board** authorizes the Federal Reserve Bank of New York to lend up to $85 billion to the largest American (and global) insurance company **American International Group** (AIG) under Section 13(3) of the Federal Reserve Act. AIG is on the verge of failure because of its exposure to credit default swaps; later the $85 billion deal is increased to $123 billion and later on to $150 billion.
17 September 2008	The **Security and Exchange Commission** (SEC) announces a temporary emergency **ban on short selling** in the stocks of all companies in the financial sector. **Lloyds TSB** takes over Britain's biggest mortgage lender, **HBOS**, in a £12 billion deal creating a banking giant holding close to one third of UK's savings and mortgage market. The deal follows a run on HBOS shares.
18 September 2008	**Treasury Secretary Paulson** announces a $700 billion economic stabilization proposal that would allow the government to buy toxic assets from the nation's largest banks, a move aimed at shoring up balance sheets and restoring confidence within the financial system. An amended bill to accomplish this is passed by Congress on October 3.
21 September 2008	The **Federal Reserve** approves the transformation of **Goldman Sachs** and **Morgan Stanley** into bank holding companies (commercial banks) from investment banks in order to increase oversight and allow them to access the Federal Reserve's discount (loan) window.
26 September 2008	**Washington Mutual** becomes the largest thrift failure with $307 billion in assets. JP-Morgan Chase acquires the banking operations of Washington Mutual in a transaction facilitated by the FDIC.
28 September 2008	Nationalization of **Bradford and Bingley** in the UK. Spain's **Santander** buys 200 of its branches and £22 billion savings book.
29 September 2008	The **FOMC** authorizes a $330 billion expansion of swap lines with the Bank of Canada, Bank of England, Bank of Japan, Danmarks Nationalbank, ECB, Norges Bank, Reserve Bank of Australia, Sveriges Riksbank and Swiss National Bank. Swap lines outstanding now total $620 billion. The **Federal Reserve Board** expands the TAF, announcing an increase in the size of the 84-day maturity auction to $75 billion and two forward TAF auctions totaling $150 billion to provide short-term (one- to two-week) TAF credit over year-end. The **FDIC** announces that **Citigroup** will purchase the banking operations of **Wachovia** Corporation. The FDIC agrees to enter into a loss-sharing arrangement with Citigroup on a $312 billion pool of loans, with Citigroup absorbing the first $42 billion of losses and the FDIC absorbing losses beyond that. In return, Citigroup would grant the FDIC $12 billion in preferred stock and warrants. Later **Wells Fargo** makes a competing proposal and takes over Wachovia without FDIC assistance.
29 September 2008	**Fortis**, a large banking and insurance company based in Belgium but active across much of Europe, receives € 11.2 billion ($8.2 billion) from the governments of the Netherlands, Belgium and Luxembourg. **Dexia** is also rescued (€ 6.4 billion) by France, Belgium and Luxembourg. **Ireland extends bank guarantees**, covering an estimated € 400 billion bank liabilities including deposits, covered bonds, senior debt, and dated subordinated debt for two years, de facto putting other EU countries at a disadvantage. The move leads to a domino effect across Europe, most countries increase deposit guarantees, many up to 100 percent.
30 September 2008	**Iceland**'s government takes a 75 % share of **Glitnir**, Iceland's third-largest bank, by injecting € 600 million ($850 million) into the bank. The following week, it takes control of **Landsbanki (7th October)** and soon after places Iceland's largest bank **Kaupthing** (9th October, $864 million) into receivership as well. In the **USA**, July recorded the **biggest ever fall in house prices**.

3 October 2008	**Wells Fargo Bank** announces a takeover of **Wachovia Corp**, the fourth largest US bank. (Previously, Citibank had agreed to take over Wachovia).
	Congress passes and **President** Bush signs into law the Emergency Economic Stabilization Act of 2008 (Public Law 110 – 343), which establishes the **$700 billion** Troubled Asset Relief Program (TARP).
5 October 2008	The **German** government moved to guarantee all private savings accounts and arranged a bailout for **Hypo Real Estate** ($50 billion, raised to $71 billion on 6th October), a German lender.
	The UK Government provides $60 billion and takes a 60 % stake in the **Royal Bank of Scotland** and 40 % in **Lloyds TSB** and **HBOS**.
7 October 2008	The **Federal Reserve Board** announces the creation of the **Commercial Paper Funding Facility (CPFF)**, which will provide a liquidity backstop to US issuers of commercial paper through a special purpose vehicle that will purchase three-month unsecured and asset-backed commercial paper directly from eligible issuers. The **FDIC** announces an increase in **deposit insurance coverage** to $250,000 per depositor as authorized by the Emergency Economic Stabilization Act of 2008.
8 October 2008	In a coordinated effort, the **US Federal Reserve**, the **European Central Bank**, the **Bank of England** and the **central banks of Canada and Sweden all reduce primary lending rates** by half a percentage point. **Switzerland** also cuts its benchmark rate, while the **Bank of Japan** endorses these moves without changing its rates. The **Chinese central bank** also reduces its key interest rate and lowers bank reserve requirements. The Federal Reserve's benchmark short term rate stood at 1.5 % and the European Central Bank's at 3.75 %. ECB also changed its procedure, making unlimited funding available at the actual interest rate (banks no longer have to bid for funds).
14 October 2008	**The US Treasury Department** announces the **Troubled Asset Relief Program** (TARP) that will purchase capital in financial institutions under the authority of the Emergency Economic Stabilization Act of 2008. The US Treasury will make available **$250 billion** of capital to nine main US financial institutions (including Citigroup, Bank of America, Wells Fargo, Goldman Sachs and JPMorgan Chase). This facility will allow banking organizations to apply for a preferred stock investment by the US Treasury. Nine large financial organizations announce their intention to subscribe to the facility in an aggregate amount of $125 billion.
17. October 2008	The **Swiss** government says it will take a 9 % stake ($5.36 billion) in **UBS** and sets up a $59.2 billion fund to absorb the bank's troubled assets. UBS had already written off $40 billion of its $80 billion in "toxic American securities." The Swiss central bank was to take over $31 billion of the bank's American assets (much of it in the form of debt linked to subprime and Alt-A mortgages and securities linked to commercial real estate and student loans).
24. October 2008	IMF announces an outline agreement with **Iceland** to lend the country $2.1 billion to support an economic recovery program to help it restore confidence in its banking system and stabilize its currency. (It is the first IMF loan to a Western European country since 1976.)
26. Oct. 2008	The IMF announces it is set to lend **Ukraine** $16.5 billion.
27. October 2008	**Iceland**'s **Kaupthing Bank (in government receivership)** became the first European borrower to **default** on yen denominated bonds issued in Japan (**samurai bonds**).
28. October 2008	The **IMF**, the **European Union**, and the **World Bank** announce a joint financing package for **Hungary** totaling $25.1 billion (**€** 20 billion) to bolster its economy. The IMF is to lend Hungary $15.7 billion, the EU $8.1 billion and the World Bank $1.3 billion.
9 November 2008	**China** announces a 4 trillion Yuan (U.S. $587 billion) **domestic stimulus package** primarily aimed at infrastructure, housing, agriculture, health care and social welfare spending. This program represents 16 % of China's 2007 GDP, and roughly equals the total Chinese central and local government outlays in 2006.

10 November 2008	The **United States government** (US Treasury Department and the Federal Reserve Board) announced further aid to the **American International Group.** AIG's September $85 billion support increased to $150 billion.
14 November 2008	The eurozone officially slips into recession, after EU figures show that the economy shrank by 0.2 percent in the third quarter of 2008.
18 November 2008	Executives of **Ford, General Motors, and Chrysler** testify before Congress, requesting access to the TARP for federal loans.
23 November 2008	The **US Treasury Department**, **Federal Reserve Board**, and **FDIC** jointly agree with **Citigroup** to provide a package of guarantees, liquidity access and capital. Citigroup will issue preferred shares to the Treasury and FDIC in exchange for protection against losses on a $306 billion pool of commercial and residential securities held by Citigroup. The Federal Reserve will backstop residual risk in the asset pool through a non-recourse loan. In addition, the Treasury will invest an additional $20 billion in Citigroup from the TARP.
25 November 2008	The **Federal Reserve Board** announces the creation of the **Term Asset-Backed Securities Lending Facility (TALF)**, under which the Federal Reserve Bank of New York will lend up to $200 billion on a non-recourse basis to holders of AAA-rated asset-backed securities and recently originated consumer and small business loans. The **Federal Reserve Board** announces a **new program** to purchase the direct obligations of housing related government-sponsored enterprises (GSEs) – Fannie Mae, Freddie Mac and Federal Home Loan Banks – and MBS backed by the GSEs. Purchases of up to $100 billion in GSE direct obligations will be conducted as auctions among Federal Reserve primary dealers. Purchases of up to $500 billion in MBS will be conducted by asset managers (the purchases began on 5th January 2009.)
5 December 2008	The November **US nonfarm employment loss** of 533,000 jobs was **the largest in 34 years**, compared with the 602,000 decline in December 1974. The US Bureau of Labor Statistics also reported that the unemployment rate had risen from 6.5 to 6.7 percent. November's drop in payroll employment followed declines of 403,000 in September and 320,000 in October.
9 December 2008	Bernard Madoff, former NASDAQ chairman, is arrested after confessing to running a $50 billion Ponzi scheme.
11 December 2008	The Business Cycle Dating Committee of the **National Bureau of Economic Research** announces that a peak in US economic activity occurred in December 2007 and that the economy had since been in a recession.
16 December 2008	The **US Fed's** Federal Open Market Committee (FOMC) votes unanimously to lower its target for the **federal funds rate** by more than 75 basis points to a range of 0.0 % to 0.25 % (an all-time historic low). Long term bond yields dropped from 2.50 % to 2.35 %.
19 December 2008	The **US Treasury** Department authorizes loans of up to $13.4 billion for **General Motors** and $4.0 billion for **Chrysler** from the TARP.
19 December 2008	An **international rescue package** of 7.5 billion euro (US$10.6 billion) **for Latvia** was announced. The IMF reports a 27-month stand by arrangement between Latvia and the IMF worth 1.7 billion euro (US$2.4 billion). The remainder of the rescue package includes 3.1 billion euro from the European Union (EU), 1.8 billion euro from Nordic countries, 400 million euro from the World Bank, 200 million euro from the Czech Republic, and 100 million euro each from the European Bank of Reconstruction and Development, Estonia and Poland. Latvia nationalized Parex Bank, its second largest bank.

2009	
8 January 2009	**Moody's** Investor Services issues a report suggesting that the **Federal Home Loan Banks** are currently facing the potential for significant accounting write-downs on their $76.2 billion private-label MBS securities portfolio. According to Moody's, only four of the 12 banks' capital ratios would remain above regulatory minimums under a worst-case scenario.
16 January 2009	The **Treasury, Federal Reserve**, and **FDIC** announce a package of guarantees, liquidity access and capital for the **Bank of America**. The Treasury and the FDIC will enter a loss-sharing arrangement with the Bank of America on a $118 billion portfolio of loans, securities and other assets in exchange for preferred shares. In addition, and if necessary, the Federal Reserve will provide a non-recourse loan to back-stop residual risk in the portfolio. Separately, the Treasury will invest $20 billion in the Bank of America from the TARP in exchange for preferred stock.
5 February 2009	The **Bank of England**'s Monetary Policy Committee **reduces** its key **interest rate** by 50 basis points from 1.50 % to 1.00 %. Interest rates are now at their lowest level since the Bank of England was founded in 1694.
12 February 2009	The **Irish government** reports a 7 billion euro (US$9 billion) bank rescue plan for two of the country's largest banks, the **Allied Irish Bank** and the **Bank of Ireland**. Each bank will receive 3.5 billion euro in recapitalization funds.
17 February 2009	President Obama signed a **US$787 billion economic stimulus bill**, 111th Congress bill H.R. 1, following House and Senate final votes on the conference report on 13 February. As passed, the stimulus package includes some US$575 billion in government spending and US$212 billion in tax cuts.
23 February 2009	The **DJIA** (Dow Jones Industrial Average, index at the New York Stock Exchange) loses 3.4 % to close at 7113.78, its **lowest level in 12 years**, and just under half the high it had reached 16 months earlier. Banking stocks led the index down; losses were experienced in most sectors.
25 February 2009	The **Federal Reserve Board**, **Federal Deposit Insurance Corporation**, **Office of the Comptroller of the Currency** and the **Office of Thrift Supervision** announce that they will conduct forward-looking economic assessments or „**stress tests**" of eligible US bank holding companies with assets exceeding $100 billion. Supervisors will work with the firms to estimate the range of possible future losses and the resources to absorb such losses over a two-year period. The assessment process is to be completed by the end of April 2009.
26 February 2009	**Fannie Mae** reports a loss of $25.2 billion in the fourth quarter of 2008 and a full-year 2008 loss of $58.7 billion.
2 March 2009	**AIG** reports a fourth quarter 2008 loss of $61.7 billion and a loss of $99.3 billion for all of 2008. This the highest annual loss of any company ever.
2 March 2009	The **Bank of England and European Central Bank further reduce** their key **interest rates** to 0.5 and 1.5 percent.
11 March 2009	**Freddie Mac** announces that it had a net loss of $23.9 billion in the fourth quarter of 2008 and a net loss of $50.1 billion for 2008 as a whole.
	Chinese total exports experienced their largest fall on record in February, declining 25.7 % for the year to US$64.9 billion. Imports also declined 24.1 % for the year.
18 March 2009	The **FOMC** votes to maintain the target range for the effective federal funds at 0 to 0.25 percent. In addition, the FOMC decides to increase the size of the Federal Reserve's balance sheet by purchasing up to an additional $750 billion of agency mortgage-backed securities (bringing its total purchases of these securities to up to **$1.25 trillion** this year) and to increase its purchases of agency debt this year by up to $100 billion to a total of up to **$200 billion**. The FOMC also decides to purchase up to **$300 billion** of longer-term Treasury securities over the next six months to help improve conditions in private credit markets. Finally, the FOMC announces that it anticipates expanding the range of eligible collateral for the TALF (Term Asset-Backed Securities Loan Facility).

31 March 2009	**US housing prices** continue to fall. The Standard & Poor's S&P/Case-Shiller 20-City Composite Index fell 19.0 % annually in January 2009, the fastest on record. High inventories and foreclosures continue to drive down prices. All 20 cities covered in the survey showed a decrease in prices, with 9 of the 20 areas showing rates of annual decline of over 20 %. As of January 2009, average home prices are at similar levels to what they were in the third quarter of 2003. From their peaks in mid-2006, the 10-City Composite is down 30.2 % and the 20-City Composite is down 29.1 %. The **World Trade Organization** (WTO) predicted that the **volume of global merchandise trade** would **shrink by 9 %** in 2009, making it the first fall in trade flows since 1982. Between 1990 and 2006 trade volumes grew by more than 6 % a year, easily outstripping the growth rate of world output, which was about 3 %.
1 April 2009	**Japan's economy** shrank 3.3 %, or by 12.7 % in annual terms. This marked the **deepest contraction** in the economy **since the first quarter of 1974**, when the global economy was reacting to the oil shock, and the second-largest decline in growth in the post-war era. Japan experiences a record decline in exports. Total exports fell 13.9 % in quarterly comparisons and by a stunning 45.0 % in annual terms.
2 April 2009	At the **G-20 London Summit**, leaders of the world's largest economies agreed to tackle the global financial crisis with measures worth $1.1 trillion including $750 billion more for the International Monetary Fund, $250 billion to boost global trade and $100 billion for multilateral development banks. They also agreed on establishing a new Financial Stability Board to work with the IMF to ensure cooperation across borders, closer regulation of banks, hedge funds and credit rating agencies as well as a crackdown on tax havens. However, they could only agree on additional stimulus measures through the IMF and multilateral development bank lending and not through country stimulus packages. The leaders reiterated their commitment to resist protectionism and promote global trade and investment.
7 May 2009	The **Federal Reserve** releases the results of the Supervisory Capital Assessment Program („**stress test**") of the 19 largest US bank holding companies. The assessment finds that the 19 companies could lose $600 billion during 2009 and 2010 if the economy were to follow the more adverse scenario considered in the program. The **ECB** lowers its **key interest rate to 1 %.** Central bank interest rates are at all-time low levels in America, Britain and the eurozone.
14 May 2009	In the first quarter of 2009 the Spanish economy suffers the biggest decline in 50 years.
20 May 2009	The Japanese economy shrinks by 12.7 % year-on-year in the first quarter of 2009. This is its fastest decline ever.
21 May 2009	**Standard and Poor's** Ratings Services lowers its outlook on **United Kingdom government debt** from stable to negative because of the estimated fiscal cost of supporting the nation's banking system. S&P estimates that this cost could double the government's debt burden to about 100 percent of GDP by 2013.
27 August 2009	The **FDIC** announces that the number of „**problem banks**" has increased from 305 insured institutions with $220 billion in assets at the end of first quarter of 2009 to 416 institutions with $299.8 billion of assets at the end of the second quarter of 2009.
10 September 2009	One year after the collapse of Lehman Brothers, the US banks still in operation report high profits again.
18 September 2009	In Spain there are 3 million properties on the market that are not finding any buyers. German exports experienced a year-on-year decline of 18.2 %.

2010	
13 January 2010	The **Financial Crisis Inquiry Commission (FCIC)**, created by Section 5 of the Fraud Enforcement and Recovery Act of 2009, holds its first public hearing in Washington, D.C.
24 February 2010	**Freddie Mac** reports a **net loss** of $6.5 billion in the fourth quarter of 2009 and a full-year 2009 net loss of $21.6 billion, compared with a $50.1 billion net loss in 2008.
26 February 2010	**Fannie Mae** reports a **net loss** of $15.2 billion in the fourth quarter of 2009 and a full-year 2009 loss of $72.0 billion, compared with a loss of $58.7 billion in 2008.
2 May 2010	Greek Prime Minister Papandreou says **Greece has sealed deal with EU and IMF**, opening door to a **bailout** in return for extra budget cuts of 30 billion euros over three years. The aid package (provided by the IMF and euro zone members on a bilateral base) amounts to **110 billion euros** over three years and represents the first rescue of a member of the then 16-nation euro zone.
28 May 2010	The **Congressional Budget Office** releases a **study describing the various actions by the Federal Reserve to stabilize financial markets since 2007** and how those actions are likely to affect the federal budget in coming years. The report also presents estimates of the risk-adjusted (or fair value) subsidies that the Federal Reserve provided to financial institutions through its emergency programs.
20 September 2010	The Business Cycle Dating Committee of the **National Bureau of Economic Research** states that **the recession in the USA – which had begun in December 2007 – ended in June 2009**. It lasted 18 months, which makes it the longest of any recession since World War II (previously the longest postwar recessions had been those of 1973-75 and 1981-82, both of which lasted 16 months).
1 October 2010	The **Financial Stability Oversight Council** holds its inaugural meeting. The council consists of nine members and has the main purpose of identifying risk in the United States financial system.
22 November 2010	**EU/IMF** authorities unanimously agree to a (€85 billion) three year joint **financial assistance programme for Ireland** in response to the Irish authorities' request. Ministers concur with the Commission and the ECB that a loan to Ireland is warranted to safeguard financial stability in the euro area and the EU as a whole.

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It started with rising delinquencies and foreclosures on the American property market in 2007, when the majority (including top US government and central bank officials) still believed that it was a crisis of mortgage finance (or a special segment of it) and that the problems would not spread to the rest of the economy. For most, a severe crisis was unimaginable in developed countries with sophisticated financial sectors, especially in the leading economy in the world. However, by the autumn of 2008 the crisis had brought Wall Street to the verge of collapse. Unprecedented scenes followed: bankruptcies or bailouts of the masters of the financial universe, including the two largest financial corporations of America (Fannie Mae and Freddie Mac), the largest insurance company in the world (AIG) and all of the five big Wall Street investment banks. It soon went global, after the collapse of Lehman Brothers interbank lending was frozen worldwide, central banks (the lenders of last resort) remained the lenders of only resort. The United Kingdom witnessed the first run on a bank in more than a century, mortgage lenders, banks, corporations and even countries all around the world went bankrupt or were bailed out almost on a daily basis. By 2009, it was clear that this was the largest global financial crisis since the Great Depression. How could American borrowers defaulting on their mortgages (in volumes of tens or hundreds of billions of dollars) trigger a multitrillion dollar global financial meltdown? How was it possible in the United States to get a mortgage loan up to 100% of the value of the property without verified income, job or assets? How could financial innovations praised for a long time lead to a chain reaction wiping out whole segments of the financial industry? How could so many financial institutions be so fragile that a few percentage points loss in their asset portfolio would bring them to the brink of bankruptcy? How did government action and inaction not only allow this to happen but contribute to it, turning America to a big financial Las Vegas? A giant casino, where (unlike in real gambling casinos) the bets are guaranteed by the government, so almost everybody is gambling because one can never lose, the gains are privatized, and the losses nationalized. How it was possible to gamble for so long without serious consequences? In his search for answers to these questions, Zsolt Gál in his book examines the causes of the last financial crisis. He offers a detailed view on the incentives of various actors, showing that gambling from Main Street to Wall Street was rather a rational strategy as the consequence of pervasive systemic motivations. One should change the system challenging these motivations to prevent history from repeating itself.

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