# *Six months into the US financial crisis: key numbers and lessons*

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*The article offers and overview of the US financial system in the midst of the crisis – i.e., winter of 2008-09. While it considers the main policies undertaken by the new Obama administration, the analysis focuses mainly on the numbers and trends that will determine the financial sector's ability to return to full functioning and break the adverse feed-back loop between the financial sector and the real economy, which is driving towards protracted recession. The evolution of the financial crisis presents the Obama administration with hard choices on how to eliminate toxic assets and recapitalize and re-regulate the financial to avoid further crises in the medium-long term. The analysis indicates that the US banking sector is poised for a $1.6 trillion loss over 2008-10, of which $850 billion have already been recognized and written-off by the end of 2008. The additional losses expected over 2009-10 are about $750 billion, compared to $1.4 trillion of capital and reserves. Thus, the financial system appears to be in poor health. Despite these alarming numbers, the outlook for the industry remains positive as long as the Fed remains on the current path of extremely aggressive monetary policy and allows banks to recover profitability and reserves. A more difficult task for Obama is to solve the riddle of introducing effective market regulation and supervision, both in the USA and internationally – within the G20 and G7. Although the approach to financial regulation taken so far is clearly not sustainable, the re-regulation task presents risk of overreaching. The case for preserving room for financial innovation is justified by the fundamental need to spread business risks, to finance risky ventures. The dilemma, then, is how and to what extent to*

*regulate non-bank assets and the leading markets in derivatives and securitization instruments.*

> *"We shall restore, not destroy. We shall deal with our economic system as it is and as it may be modified, not as it might be if we had a clean sheet of paper to write upon; and step by step we shall make it what it should be"*
>
> Woodrow Wilson, First Inaugural Address, 4 March 1913

## 1. Foreword

This paper examines the current financial crisis by putting into perspective some of the "facts and numbers" that need to be considered if we are to gain some understanding of what happened and what the future is likely to bring, in light of the corrective measures being proposed, enacted and implemented in the United States and other countries. The focus is mainly on the US, which is in the eye of the hurricane owing to the role the American economic policies had in prompting a housing bubble and a series of Ponzi schemes leading to bank failures. The period we consider begins in late 2007 and covers such landmark events as the failure of Lehman Brothers in mid-September 2008 and the collapse and nationalization of AIG through four distinct bailout interventions. The cutoff date for data is 29 March 2009.

The paper is structured as follows: Section 2 provides some background on the crisis and its latest developments; Section 3 discusses the logical framework and key data for proper interpretating the dynamics of the crisis and possible remedies; Section 4 and 5 concentrate on the housing and mortgage markets and the aggregate balance sheet of the household sector – which is as a key element in the "adverse feedback loop" that is crippling the economy and in driving the expected losses caused by market trends; Section 6 and 7 looks at the aggregate balance sheet of corporate and financial sectors in order to estimate the losses that the current financial crisis is likely to cause in 2009-10. Finally, Sections 8 and 9 put forward some interpretations and concluding comments. Data gathering has been

extensive, so as to give as comprehensive a picture as possible, while awaiting the IMF's upcoming Global Financial Stability Report.[1]

## 2. An update on the US financial crisis

Six months of debate on the financial crisis have shifted attention away from subprime mortgages and focused it on the collapse of such pillars of the American financial system as the AIG insurance group and the cluster of government sponsored enterprises (GSEs) like Fannie Mae and others that support the home mortgage industry. The difficulty of diagnosing the causes of the crisis has become more apparent as the role of these key agents is dissected in the public domain and in Congressional testimonies by the "key players" of the system. There are two fundamental causes that appear increasingly important. First is the opacity of the financial system, with its expanding infrastructure of interdependent markets and non-bank financial institutions that became crucial to the growth of the real economy. The web of counterparty relations has been vastly extended by rapid financial globalization and innovation and by the massive growth of derivatives, and financial products developed by non-bank financial intermediaries that were able to expand their assets enormously without any deposit money and outside the close supervision of central banks and regulators.

The second explanatory factor is the complacency of regulators and supervisors in the face of globalization, financial innovation and the steadily growing role of non-bank financial institutions: hedge funds, sovereign wealth funds, financial insurers, and mortgage and other specialized financial service providers that differ fundamentally from deposit-taking institutions. By interacting among themselves, these

[1] The data used for this analysis include analyst reports and trade associations as well as ad-hoc information reported by DJ-Wall Stree Journal news-wires. The main source is the Federal Reserve's Flow of Funds accounts for 2008. Overall data limitations are significant and the estimates should be treated with caution – problems of heterogeneous data, duplication and aggregation are serious. All errors are solely attributable to the author. More analytical information will become available in the upcoming IMF Global Financial Stability Report (GFSR).

agents expanded trading of a host of complex financial products in unregulated markets, creating what can well be called a "shadow financial system in plain sight". Large and systemically connected institutions could operate through units that were partly invisible to regulators due to lack of unified supervision: this is the case of the AIG Financial Products, the London unit operating in the unregulated credit default swaps market which supervised in New York, and was within the consolidation perimeter of the AIG insurance group.[2] The very high level of risk-taking displayed by systemically important institutions would not have been possible without an opaque environment – in which product complexity and lax regulation provided ample scope for arbitrage – and a complacent policy environment – in which public trust was consigned to market forces with the idea that they were essentially self-regulating.[3] Thus, the impression that the rules were not enforced has given way to the realization thesis that the rules simply were not in place, especially in key areas of risk-taking and profit-making by large financial institutions.

Recognition of the "major regulatory failure" within the US and global financial system has come in large measure thanks to the work of US Congressional committees that are trying to come to grips with the consequences of this crisis for the US economy and its world position. A high point in the recent debate was reached in March at the Senate Banking Committee discussion of the fourth AIG bailout (*Box 1*). All the leading US regulators – the Federal Reserve, the New York State Insurance Department, and the Treasury's Office of Thrift Supervision – had explanations to offer for the performance of AIG. Faced with a loss of some

[2] AIG-Financial Products is the unit operating in CDS and asset-backed securities that contributed to AIG liquidity problems, and was ultimately responsible for huge losses in 2008.

[3] Christopher Cox, Chairman of the Security and Exchange Commission, testified: "The Federal government has failed the taxpayers by not regulating the Swap Market. The regulatory black hole over the Credit Default Swaps – CDS – is one of the most significant issues we are confronting in the current crisis. The Over-the-Counter, CDS market has drawn the world major financial institutions and others into a tangled web of interconnections where the failure of any one institution might jeopardize the entire financial system. This is unacceptable for a 'free-market' economy". See Robert O'Harrow and Brady Dennis, "The Crash [of AIG]: What Went Wrong", *The Washington Post*, 31 December 2008.

$62 billion in the 4th quarter of 2008 and $100 billion for the year – the largest loss in US economic history – the acting director of the OTS, Scott Polakoff, admitted that his agency had "failed to catch problems at the AIG and that no one predicted, including the Treasury/OTS, the amount of funds that would be required to meet collateral calls and cash demands on the credit-default swap transactions."[4] Congress is now bound to deal with "systemically connected institutions" and is even considering breaking up institutions that are "too big to fail and to manage."[5]

As the Obama administration's *anti-crisis measures* come to the fore, Congress is beginning to grasp the complexity and enormous difficulty of "getting out of this economic crisis" and breaking the "adverse feedback loop" between the financial system and in the real economy, both in the US and in the rest of the world. The case-by-case approach taken so far in bailing out financial institutions appears increasingly

[4] See Sudeep Reddy and Michael R. Crittenden, *Wall Street Journal*, 6 March 2009: Some $19 billion of the payouts went to two dozen counterparties between the government bailout in mid-September and early November. As previously reported, nearly three-quarters went to a group of banks, including Société Générale SA ($4.8 billion), Goldman Sachs Group ($2.9 billion), Deutsche Bank AG ($2.9 billion), Crédit Agricole SA's Calyon investment-banking unit ($1.8 billion), and Merrill Lynch & Co. ($1.3 billion), the *Journal* reported at the time. Democrats and Republicans, expressing rising frustration with the AIG rescue, blasted the central bank for some of its decisions related to the loans: "It's not clear who were rescuing – whether it is whatever remains of AIG or its trading partners,"said Senate Banking Chairman Christopher Dodd, a Connecticut Democrat. "It's reasonable to ask why holders who would have received only pennies on the dollar for their credit-default swaps absent any government intervention would expect or deserve payments for what essentially is a bankrupt company." At the hearing Mr. Kohn did not disclose the names of AIG's trading partners and raised strong criticism from Committee members, who stressed that "Public confidence in what we're doing is at stake; it's their money that is being poured into these institutions." A few days later AIG made the list public.

[5] The public opinion issue faced by the Obama administration in pushing these continuous bailouts of financial institutions was clearly spelt out in the Senate Banking Committee discussion. Democratic and Republican members asked why US taxpayers should honor the insurance/derivative contracts issued by AIG in the global marketplace when the beneficiaries were foreign banks and competitors of the US. The answer by the Fed Vice Chairman Donald Kohn was unequivocal: "I'm worried about the knock-on effects in the financial markets. Would other people be willing to do business with other U.S. financial institutions…if they thought, in a crisis like this, they might have to take some losses?" The risk of moral hazard was deemed inevitable, as Kohn conceded that the government's action helped the firms avoid losses and as a result "will reduce their incentive to be careful in the future."

problematic, even for a Democratic Congress that is naturally inclined to back the Administration's resolution to "act aggressively and not to stop until the problem is overcome." The political dilemmas posed by this approach were made evident by the case of AIG, a company now 87% owned by the federal government, but with non-voting stock. The decision to recapitalize by means of preferred shares is not only ambiguous in terms of calculating Tier 1 capital,[6] but also confusing in its implications for the governance of financial institutions that are "non-nationalized, but *de facto* government-controlled." The case of the "retention bonuses" paid by AIG in March 2009 underscored the severe scrutiny that the public expects from the government over financial institutions that receive public money. This explains the public anger over the payment of $165 million to secure the "orderly unwinding" of the AIG-Financial Products' $2.7 trillion portfolio.[7] The public outcry over the performance bonuses highlights the contradiction between huge bailout money injections and the lack of clear governance conditions attached to such bailouts. If the new ownership structure of the entities benefitting from government bailouts does not entail any change in control or influence on their management then these financial institutions are left with a hybrid of private and public practices that is simply not viable. The protracted period of time that is likely to be required either to break these institutions up or to restore their market standing is bound to cause some political fallout for the Obama administration. The extent of the damage could become more evident also during the imminent discussion on the $3.8 trillion budget submitted to Congress.

The case also shows that Congress is not prepared to envisage other, more permanent solutions for any "ailing banks" that fail (while

[6] See "Bank Capital – Stress-test mess", *The Economist*, 28 February 2009. p.75: "Tangible common equity (is) the purest and most flexible form of capital which bears the first loss when an asset goes sour. The rest, (such as) preference stock, much of it government-owned, is not truly loss-bearing. The Basle Committee tried to limit such hybrid capital that sits between equity and debt".

[7] This payment was disclosed in mid-March 2009 and caused much consternation, since it involved the same business unit that had caused the downfall of AIG and forced the Fed and the Treasury to carry out four successive rounds of capital injection for a total of at least $170 billion (see Box 1).

**Box 1 – The AIG Quasi-Nationalization**

i. At the end of 2007, the Financial Products Unit of AIG – described by President Obama as "a hedge fund on top of a large insurance company" – had $78 billion worth of credit default swap contracts guaranteeing the performance of investments in securities such as CDOs based on credit receivables, only a small part of which were sub-prime mortgages.
ii. Overall this unit had 50,000 outstanding swap and derivative contracts with 2,000 counterparties, for a notional exposure of $2.7 trillion; before the nationalization in September the unit was managed by Joseph Cassano and had 450 employees. AIG's notional exposure as of March 18 was estimated at $1.6 trillion. The capital injections by the Treasury and the Federal Reserve were carried out in four rounds.
iii. The first two rounds consisted of an $80 billion, 2-year emergency loan in September – in exchange for 80% of AIG's equity in non-voting preferred stock – with an interest rate of 15%. With the approval of the $700 billion, TARP legislation, AIG was allowed to get funding up to $123 billion and convert some debt into non-voting stock as capital replenishment.
iv. The third round in November led to the restructuring of the emergency loan, which was reduced to $60 billion for 5 years at 2%. In addition, the Fed stepped in by buying ABSs guaranteed by AIG derivative contracts, thus eliminating the risk of AIG being faced with additional "capital calls" in the likely event of further price declines. The approach was similar to the initial Bear Stearns intervention and engendered two special investment vehicles named "Maiden Lane II and III." These SIVs hold about $62.1 billion of ABSs worth an estimated $29.6 billion in December 2008.* The premium paid by the Fed over market price is due to the underlying CDS issued by AIG, which insures buyers of ABS against the risk of price decline – not default; as these securities appear to be returning interest to the SIVs, the Fed stands to gain in the event of a market normalization. After the second round the US government owns about 87% of AIG equity in exchange for $40 billion from the TARP, which Congress passed in October 2008.
v. The fourth bailout, in March 2009, included various measures to accelerate the break-up of the AIG Group, but it also eliminated the dividend yield of 5% on the preferred shares held by Treasury and provided additional capital of $30 billion in TARP funds to avoid the downgrading of AIG after the losses reported for 2008. The total of government interventions is estimated at $165 billion, and its allocation among the counterparties of AIG's derivative trades are reported on the insurer's website: http://www.aig.com .

* See: Binyamin Appelbaum and Brandy Dennis, "*Key Argument for Incentives Questioned*", The Washington Post, 19 March 2009, pp. A1-A6.

continuing to rely on FDIC to deal with banks in critical conditions, as those twenty banks that have already been taken over in 2009 by the FDIC). Attention now focuses on the bad assets not held by the bad banks that might fail thes Treasury's "stress test" as part of Secretary Geithner's "financial rescue" efforts. For Congress, it is getting harder to approve new appropriations of taxpayers' resources for *more of the same* bailouts seen so far. As the facts about AIG became known to the general public (*see Box 1*), the Administration is caught between the public outcry for accountability ("get the money back") and the implications of pre-empting private contracts retroactively – as Congress has sought to do with legislation that would subject the bonuses of employees of banks that have gotten more than $5 billion to a 90% income tax. While the case of AIG remains open, the "prudent management argument" advanced by Edward M. Liddy could prevail,

as Congress sets "punitive legislation against bonus recipients" aside[8]: After all, the need to protect taxpayers against catastrophic losses on a residual portfolio of derivatives estimated at $1.6 trillion is self-evident. As the Obama administration is trying to preserve the sense of "public legitimacy" of the multiple efforts to rescue financial institutions. Secretary Geithner is faced with the need to deflect criticisms for not allowing AIG to go into receivership/bankruptcy, which would have pre-empted all its existing contracts.

As the memory of the damage caused by the Lehman "non-intervention" fades, both Secretary Geithner and Federal Reserve Chairman Bernanke have gone before the Senate Banking Committee to ask for more powers over non-bank financial institutions. Their message was clear: the federal agencies did not have the power to seize AIG, or any non-bank financial institution that is not under their supervision; they did their best.

While this debate continues, it is clear that the US government is at a turning point. Both the traditional moral hazard argument and the new call for "accountability in the use of public resources" represent a potentially lethal critique of the current "unlimited, case-by-case" approach to the financial crisis. What comes next depends on the state of the world and how the economy responds to these policy initiatives. The shape of the 2009 budget that emerges from Congress will determine whether President Obama will be able to "do whatever it takes to solve the financial and economic crisis", as he keeps repeating. At this point it is unclear how much "fiscal stimulus" can be provided, and most of the action is within the financial domain of the Fed, the FDIC, and the Treasury. Obama's intention to stay on the aggressive course charted in the budget proposal will soon face a reality check, particularly on the issues of burden sharing and cooperation with the EU and the broader international community.

At the meeting of the economic ministers of the G20 to prepare the Heads of State gathering in April in London, the United States was pressed to "clean up its own mess" before asking others to provide any

[8] See Edward M. Liddy, "Our Mission at AIG: Repairs and Repayment", *The Washington Post*, 18 March 2009, p. A13. Mr. Liddy is the CEO of AIG.

extra fiscal stimulus or rescue efforts. Lack of agreement on coordinated fiscal stimulus or international regulatory reform and new rules of conduct for market participants is potentially costly and could lead to uncoordinated, unilateral actions. This scenario is likely to present the greatest risks, as the United States comes to realize that there is not enough money – even for a $15 trillion economy – to "ring-fence" all bad assets, save all financial institutions, automotive groups, and protect all social groups and stakeholders. The Republicans are gaining some traction on these issues, but the president's great popularity means it is he who will have the final say.

## 3. A magnifying glass on the crisis and the "adverse feed-back loop"

The numbers presented here represent a broad range of indicators deriving from a commonly used, simplified logical framework. The story has two sides, one for the financial and one for the real sector.

On the financial side, two markets are identified as the *trigger factors* – i.e., the housing and the subprime mortgage markets. The trends in these markets spill over into a whole class of structured products such as the asset-backed securities that soon begin to be perceived as "toxic assets". The Financial institutions' fear of balance-sheet contagion results in the freezing up of the interbank credit markets, the collapse of securitizations and the spreading of liquidity crises. The risk aversion among participants in the repurchase (repo) and commercial paper markets spreads to money market funds and affects the broader investor community, causing the collapse of stock market. At this stage begins the widespread loss of wealth and asset deflation in the balance sheets of all economic agents, although the real economy has yet to be affected.

Turning to the real economy, financial market developments have a psychological effect on consumers and alter expectations and behavior of producers and business in general, severely curbing demand – the rapid adjustment of inventories causes trade to syddenly decline. Deleveraging becomes unavoidable for most economic agents as the value of their assets is curtailed while debt remains fixed in nominal terms. Shedding assets to reduce debt is combined with the

postponement of all types of expenditure to avoid default and build up contingency reserves. The deflation psychology results in the massive destruction of demand. The cyclical downturn deepens, with unemployment and the destruction of productive capacity. The financial sector adjusts by tightening credit standards and reducing risk-taking to soften the impact of the recession. Finding credit is increasingly difficult. At this point the crisis takes on a whole new dimension as financial and real variables interact and cause a negative spiral: the "adverse feedback loop" that we can now observe at work.

In the midst of what appears to be the deepest global recession since World War II,[9] it is now clear the "adverse feedback loop" is crippling the world economy and rapidly accelerating the US recession. Following *Figure 1* by John Kiff and Vladimir Klyuev (2009), the dynamics of the crisis can be seen as a four-step process.

*Phase 1:* The growing disequilibrium in real estate markets across the US causes the "housing bubble" to burst at the end of 2006,[10] and the "sub-prime markets" to collapsed – i.e., the markets for securities backed by mortgage loans to borrowers with "tainted credit records" and inadequate income.

*Phase 2:* The contagion spreads across financial institutions and asset classes exposed to subprime and housing risk. This phase began in late summer of 2007 and brought the collapse of Bear Stearns in early 2008. The mounting liquidity causes distress across financial institutions that relied on short-term funding instruments – such as broker-dealers – and leads to freezing the commercial paper and interbank money markets.

*Phase 3:* This phase began in late summer of 2008 with the default of Lehman Brothers and panic among general investors. Plunging financial and real asset prices had massive negative wealth effects on

[9] The World Bank forecasts indicate that "The global economy is likely to shrink this year for the first time since World War Two, with growth at least 5 percentage points below potential. World Bank forecasts show that global industrial production by the middle of 2009 could be as much as 15 percent lower than levels in 2008. World trade is on track in 2009 to record its largest decline in 80 years, with the sharpest losses in East Asia." http://go.worldbank.org/U05NMJJNZ0

[10] Robert J.Shiller (2008), *The Subprime Solution*, Princeton University Press, pp. 39-68.

consumers, drove down collateral value of assets for all lenders, and caused further reduction of credit supply, effective demand and output.

*Phase 4:* is the current phase. The "adverse feed-back" is now in full swing, with mounting repercussions on the real economy and the financial system of the US and of other countries. The impact on the balance sheets of financial institutions has just began to emerge with the financial reports for 2008 – as in the case of Fannie Mae, Freddie Mac and AIG, which have recorded losses in excess of $150 billion for the year. The real economic decline highlighted by indicators released early in 2009 has caused a further loss of confidence and deterioration of asset prices and credit conditions, thus further weakening financial institutions and sparking renewed calls for government action. In the US and the UK policymakers have stepped in with additional bailouts for the very same institutions that they rescued in October.

## 4. The subprime and housing bubbles

The housing and mortgage markets are fundamental to understand the dynamics of this crisis. The *housing bubble* (which began in the late 1990s and peaked in 2006) has been broadly discussed, and ample evidence is available both from the indexes provided by S&P/Case-Shiller (*Figure 2*) and from a broader measure of the housing markets provided by First American CoreLogic (see *Table 1*). All the indicators from 2000 on show growth far outpacing the rise in the underlying cost, inflation, population and other structural indicators.[11]

The link between credit markets and housing price inflation was particularly evident in key areas of the country such as California, Florida and a group of states that were experiencing extraordinary growth in construction activity, mortgage origination, and home prices.

[11] See Robert J. Shiller (2008) *The Subprime Solution,* p.40. Shiller points out the importance of psychology to the real estate bubble, with help from the dot.com bubble of the 1990s. This was the driving factor behind the fraud perpetrated by mortgage originators and lenders which led them to abuse the trust of markets and investors by originating loans to unqualified borrowers; this also drove the greed among the agents involved in creating, rating, and trading mortgage-backed securities.

This link has been highlighted by the empirical work of Giovanni Dell'Ariccia et al.[12] which shows that the lowering of lending standards is closely correlated with the growth of lending activity and the rise in housing prices in various US markets. The analysis also brings out the importance of credit market structural features: new entrants in the mortgage origination business explain the faster lending growth and the lower credit standards. There is also evidence that mortgage securitization – i.e., the disintermediation of the banking system – was correlated with declining credit standards; this indicates the need for regulators to monitor the loan originators that did not retain any portion of their loan portfolio, but disposed of it all in the capital market. Thus, there was a fundamental misalignment of incentives between originators and investors.

The "numbers" that best convey the scale of the disruption caused by the housing bubble are supplied by a few basic market indicators. The drop in house prices has been the most severe since the Case-Shiller index was introduced 21 years ago. The yearly decline of 18.5% registered in the 20 largest US cities in 2008 is likely to reach 22.5% between October 2007 and the end of March 2009 (*Table 1*). The overall loss of residential property value is captured by the data of First American CoreLogic covering more than 11 million houses or about 80% of the US market. Such a broader indicator shows an 11.1% decline during the same period – which is also a record number causing a loss of residential property values of about $2.4 trillion over an estimated value of such a stock of property of about $19.3 trillion at the end of 2008.

The broader CoreLogic measurement of housing prices indicates a less steep fall in prices (-11.1% for 2008), but still a record. The same source estimates a loss of housing value of about $2.4 trillion, bringing the value of Americans' housing assets down to $19.3 trillion at the end of 2008. To help put these numbers in perspective, *Table 2* shows the impact of a 25% decline in the asset value of the USA household sector

[12] G. Dell'Ariccia, I. Deniz Igan, and L. Laeven, 2008, "Credit Booms and Lending Standards: Evidence from Subprime Mortgage Market," International Monetary Fund Working Paper, WP/08/106, April.

– which is less than the one experienced by the Japanese economy[13] in the housing component of their balance sheet, as suggested by Richard C. Koo (2008). In the USA case a 25% decline in housing prices causes a loss of $ 4.5 trillion or about 30% of GDP. This loss is much lower of the equivalent impact of a 25% decline in the value of financial assets held by USA households, which amounts to $7 trillion. Altogether, the 25% decline in housing and financial asset values can cause a loss of wealth of the order magnitude of 75% of the USA GDP over the reference period 2007-10.

The loss of wealth has significant repercussions on consumer demand, which is being curtailed in order to increase savings, accumulate cash and reduce debt in the face of growing uncertainty and the declining value of most American households' most valuable asset, namely their homes. Overall this is emerging as a major constraint for the management of the crisis – notwithstanding reduced interest rates and some revival of mortgage lending by the government sponsored enterprises, such as Fannie Mae, Freddie Mac, and the Federal Housing Administration – i.e., the FHA which is expanding its federal guarantees to help mortgage origination.

But the key constraint to recovery is the fact that many households that would otherwise qualify are currently unable to roll over their mortgages (i.e., to access the 30 year fixed-rate mortgages offered by the federal agencies at 4.8%) because they have "negative equity" in their homes. As the housing market deteriorates, a growing number of American families are unable to pay or else are not willing to continue paying mortgages that exceed the value of the home. At the risk of compromising their credit record, some households have simply stopped paying and are seeking to renegotiate or else are willing to accept foreclosure on their properties which may be second homes purchased with no-money-down mortgages, which were available until early 2008.

[13] See Richard C. Koo (2008), "'Plan-B'" for the Global Financial Crisis", Nomura Research Institute, Tokyo, 22 October. The analysis of the Japanese economy brings out the key role of "balance sheet remediation" in driving the behavior of both businesses and households in what Koo calls a "balance sheet recession".

Against the backdrop of widespread situations of negative home equity, the United States is experiencing a rapid increase in delinquencies (defined as instalments overdue by more than 60 days) among borrowers of all categories. This new population of distressed homeowners adds to the number of households at risk in the subprime category (estimated at 1.6 million loans in mid-2008).

The key numbers to consider are the percentage of mortgage owners either already in a situation of "negative equity" or expected to be in such apposition in the short term, 2009-10. These numbers have spiked respectively to 8 million and 10.5 million of mortgages that represent approximately 20% and 25% of total mortgage owners. Considering that these numbers include sub-prime borrowers and other previously identified categories at risk (current estimates indicate 1.6 million mortgages of subprime and 2.3 million of other loans deemed to be delinquent in mid-2008) the additional number of home owners at risk could expanded by another 4 to 6 million home owners.

## 5. The Expected Lossess on Residential and Commercial Mortages

To grasp the order of magnitude of the credit problem caused by the dynamics of the housing market one could make some simplified calculations based on an estimated average mortgage debt for each family of about $ 190,000 versus an average home value of $ 281,300 at the end of 2008 – which is equivalent to a "loan-to-value" (LTV) of 0.7 (see *Table 3* part 1). If one focuses on "highly indebted" families (see lower portion of *Table 3*), their LTV was close to 1.0 in 2007 and the value of their homes and mortgages was 15% higher that the value of 2008 – i.e., before the 15% price decline experienced since late 2007. At the end of 2008, if one assumes that 70% of mortgage owners were "highly indebted" and their "loan-to-value" (LTV) was close to 1, then their average mortgage was about US$ 309,424 and their LTV was 1.1. This would mean a negative equity of US$ 206 billion at the end of 2008. Moreover, if one assumes further declines in housing prices in the order of 15% in the next 18-24 months, this would mean an additional negative equity / loss for the household

sector of about $ 515 billion – almost 30% of which in California (see Tab. 3 part 2).

The poor quality of data makes it difficult to get an accurate measure of the stock of mortgages at risk of default. Nevertheless, one can obtain an estimate with reference to the average size of loans and the number of mortgages that are non-performing or at risk of foreclosure among households in negative equity position. The First American Core Logic data at the end of 2008 suggest that 4.6 million households is at risk in addition to the 3.9 million households with non-performing loans. If one takes the 4.4 million households expected to be in negative equity position at the end of 2008 and multiply it by the average size of mortgages one gets a value of $960 billion of mortgages at risk. By adding an estimated $467 billion referring to those mortgages that are in a "quasi negative equity" position and could default in the next 18-24 months one arrives at a total value at risk of $1.4 trillion. This total can be added on to those mortgages in default at mid 2008 and arrive at an estimate of $2.3 trillion mortgages at risk by end 2009-10, which is about 19% of the market.

To corroborate this assessment one could consider that the mortgage market data of the first quarter of 2009 point toward percentage of delinquencies that are more than doubled compared to mid 2008. Among all categories, the Alt-A mortgages appear particularly at risk as they represent borrowers with irregular income, but normally considered of high credit quality – i.e., self-employed or wealthy individuals counting of their collateral more than their documented income to access credit market. Delinquencies in this category appear to be about 20% – or 660,000 mortgages – with an average loan size of US$ 344,000 and a value at risk of $ 227 Billion in mid 2008. Comparing the estimated values of negative equity ($515 billion) and mortgage value at risk ($2.3 trillion) with the size of the household mortgage market ($10.7 trillion), we can see that the potential losses might be in the range of 20-25% of the total outstanding; 5% of it consists of negative equity positions that need to restructured in order to allow the household sector to gain liquidity and access to credit at more favorable terms (*Table 4*).

The urgency to address the issue of negative equity borrowers to facilitate an orderly resolution of their credit position is perceived as a key objective in order to stop the increasing flow of foreclosures and distressed properties that put negative pressure of prices of housing, as indicated in the comprehensive review of policy options by John Kiff and Vladimir Klyuev (2009)[14]. The success of the Obama administration's policies will be assessed against an underlying trend of foreclosures and write-offs in the credit and securities markets that is particularly dark at this point in time. Thus, it becomes clear that the health of the US financial system and its capacity to cope and reverse these trends is central in strategy of the Obama administration.

Concerns for the financial health of the USA financial system have been closely linked to the housing and mortgage market trends, and it has been noted that an additional 10-15% reduction in house prices could cause $550 billion in the form of negative equity for home and mortgage owners. The question is how much additional losses would be triggered in the credit and securities markets, where the outstanding debt of the household sector is held to maturity or traded. To this end, *Table 5* highlights the main drivers of a projected total loss of $480 billion for the financial sector in the next 2 years. The following assumptions have been made to derive such as estimate:

*(i) line 2* includes the estimated value at risk for the delinquent and seriously delinquent loans in all categories at the end of 2008 – and assumes that 80% of them will result in a loss by 2009-10 – causing an additional charge of $551 billion. This represents 4.6% of the market and would entail 86% cancellation of mortgages in arrears in mid 2008;

*(ii) line 3* includes the estimated additional value at risk due to the negative-equity mortgages outstanding at the end of 2008; assuming that 50% of them will go into default in 2009-10, this could trigger an additional potential loss of $480 billion in a scenario of a 15% decline

[14] John Kiff and Vladimir Klyuev, 2009, "Foreclosure Mitigation Efforts in the US: Approach and Challenges," International Monetary Fund Staff Position Note, SPN/09/02, February 18.

in property values in 2009-10. This represents 4% of the market and would entail 50% cancellation of mortgages in negative equity position at the end of 2008;

*(iii) line 4* includes the estimated additional value at risk for mortgages "expected to fall into negative equity" and assumes that 25% of them will go into default in 2009-10 with an additional potential loss of $117 billion, which is 1% of the market;

*(iv) line 5* is the sum of all the additional losses/write-offs expected by 2009-10 ($1,117 billion) and points toward a grand total of $1.3 trillion or 11.4% of outstanding household mortgages if we include the write-offs of $170 billion reported by the IMF in the September 2008 Global Financial Stability Report;

*(v) the final section of Table 5* shows the breakdown of the mortgage marke,of which 27.7% is are loans held by financial sector, (20.8%) are private-label securities which includes asset-backed securities sold by private pools, and the residual market is in the form of securities backed by government agencies and others.

Based on this distribution of the holders of mortgage risk, it appears that the US financial sector is at risk for $488 billion in the loan market (of which $170 billion were already recognized by mid 2008, and $313 billion are additional lossess expected by 2010). The portion of these losses referring to US banks over the 2009-10 period is $465 billion and the rest is attributable to non-residents that purchase securities and loand originated in the USA.[15]

If one looks at the commercial mortgage market in the bottom right section of *Table 4* it is appears that its overall size (about $3 trillion) is smaller than the residential mortgage market, but equally risky and widely connected with securities market (i.e., there are about $700 billion of private label Commercial Mortgage backed securities).

[15] It is worth noting that the expected losses in the private-label ABS market reported in *Table 5* are $230 billion for the whole US financial system, but only $112 billion for US banks. These values are smaller than the estimates reported at Table 9 due to the effect of the mark-to-market of securities – i.e., the larger value of losses for the financial system, reflects discount factors including both credit and liquidity risk premia that are very high in the ABS marke.

The recent trend in this market show delinquency rates near the peak of the last recession at the turn of the century. But one needs to go back to early 1990s to find price declines as deep as those under way, with a projected drop of 35-45% from the peak of 2007 in 2009-10. Historical precedents have shown the emerging of losses around 8-10 % of the outstanding values at the peak of the crisis, in addition to 30-40 decline in the market value of securities issued by construction companies and commercial developers.

On this basis, various analysts are predicting losses of up to $200-$250 billion over the 2009-10, and in line with the 7.9% is the historical loss over 1990-95 period of crisis.[16] Based of the distribution of commercial mortgage investors, it appears that $160 billion could represent losses of the US Financial sector and $135billion by US Banks. All together mortgage markets could lead to losses of $648 billion for the US Financial sector, of which $600 billion by US Banks.

## 6. Corporate deleveraging and bank credit

To gauge the impact of the financial crisis on credit markets, it is important to magnofy the links between corporate sector and financial intermediaries. Both the real economy and the financial sector, although exposed to different degrees of leverage, are now faced with major losses of capital and asset destruction, and therefore are quickly adjusting their balance sheets and their operations in order to find a new equilibrium for growth in this new environment.

In this context, the willingness of the Obama administration to expand the government's role in supplying credit has helped the economy and the highly leveraged agents to deal with a "balance sheet shock". As one can see from *Tables 6-8*, the success of these policies depends on bringing back to normal the conditions of many critical components of the financial system. The challenge is to restore

[16] See Lingling Wei, Maurice Tamman, and John Hilsenrath, "Crisis looms in commercial real estate", *The Wall Street Journal*, 27-29 March 2009. The article quotes Deutsche Bank and Foresight Analytics predicting "up to $250 billion loss over $3 trillion assets outstanding of which $700 billion securitized."

investors' confidence in financial markets while major adjustments are being made. Investors must understand the continued efforts of the financial intermediaries to re-engineer their business model, decrease leverage, and improve risk management in order to cope with the current great uncertainty, while the corporate sector continues to cut debt and reduce capacity as it waits for signs of an end to the recession.

The absence of confidence among investors, bankers and entrepreneurs is a major trigger factor of the "adverse feedback loop" that is causing a rapid deterioration in both corporate and bank balance sheets. The corporate sector's weakness is mirrored by the increased perception of credit risk by the financial sector and by the falling value of collateral, which ultimately limits banks' capacity to sustain lending to companies faced with uncertainty and declining demand. In a scenario of rapidly changing demand patterns and major shifts in relative prices and market fundamentals, banks find it hard to distinguish between liquidity and solvency crises. Thus, it becomes increasingly difficult to continue providing financial support even to creditworthy corporations and small businesses that would deserve it.

To illustrate the immediate balance sheet impact of the current financial crisis, one can take the balance sheet of the Corporate Business Sector released by the Fed in its 2008 Flow of Funds. *Table 6* illustrate how a 50% decline in the price of assets doubles the debt-to-asset ratio and causes a immediate reduction in the net wealth of Corporate sector by $10.5 trillion, leaving aside any other modification in the competitive position of the sector.

The nature of the issues posed by a rapid corporate deleveraging have been analyzed in the context of the Japanese experience of the 1990s (see Richard C. Koo,2008). Despite profound structural differences between Japan and the USA – both in the real and financial sector –, the present compression of investment demand and progressive downsizing of the corporate sector can be seen as a "balance-sheet recession" of the real economy. Similarly, the increasing liquidity preference and risk aversion by the general public are forcing both bank and non-bank financial institutions to adjust their balance sheet, to build reserves and slow asset growth by tightening their credit standards.The impact of this

twin behavior by corporate and banks results in a spiral of adverse feedback loops, which if forcing the Obama administration into a series of measures to restore both liquidity of interbank markets and proper functioning of the US credit markets.

To grasp the magnitude of the task, it may help to see few numbers on the credit aggregates involved. An overview of the US credit markets (*Table 7*) highlights the massive volumes of financial intermediation that is involved in order to allow the regular functioning of all primary sectors of the economy (Households, Business and Government) that are structurally operating with a large negative financial position. The role of Banks and credit markets is central with their net assets position of about $ 10.1 trillion, but even more important is the role of securities markets with $ 15 trillion of outstanding instruments (both on the asset and liability sides). Both banks and non-bank intermediaries play a key role in originating and structuring market instruments and securities to ensure the transfer of domestic savings from the institutional investors towards the sectors of the economy that are net borrowers.

Among all sectors, the rest of the world has become increasingly important as provider of almost $6 trillion of net credit to the USA economy; such a net creditor position reflects the critical role of foreign governments and investors in the financing of government agencies and other issuers in the securities markets (e.g., the Chinese investors that play a key role in the GSE agency markets dominated by instruments issued by Fannie Mae and Freddy Mac etc.) which account for almost 40% of US originated securities.

The basic numbers on the role of banks in the credit markets are summarized in *Table 8*. The separation of the market into the loans and securities shows the preeminent role of banks in the $12.6 trillion lending business which includes – in addition to the mortgage markets discussed in the previous section – also consumer and corporate lending, which accounts for $1.7 trillion and $3.9 trillion respectively. The leading role of banks in these markets (i.e., they represent about 80 % of total loans) offers a strong argument for aggressive policies to stabilize crises and keep a robust banking system in place to avoid disrupting consumer and corporate lending.

The role of banks in securities markets is concentrated in corporate lending – both high grade and high yield – and in asset backed securities of a wide range of underlying assets. The total of these securities is approximately 60% of the market – with all the caveats due to the highly aggregate nature of the data used in *Table 8*. Despite the major role of GSE – i.e., the Government Sponsored Entities which provide risk mitigation to institutional investors to buy pools of mortgage securities in the market –, it is clear that the banks' involvement in securities markets helps provide specialized financing to corporate and household sectors (i.e., consumer credit, commercial and industrial loans) and other risky ventures that are critical for economic growth.

As the current crisis unfolds and causes dislocation of many non-bank financial intermediaries and investment vehicles/funds, it is clear that bank intermediation becomes increasingly important to the support economic recovery. Among the hardest hit competitors of Banks are Hedge Funds specializing in lending and securities products to help corporate restructuring, consolidations, public offerings (IPOs) or leveraged buyout (LBOs) in the market. Their recent losses and increasing redemptions of funds under management[17] create a financing gap for the corporate sector which can only be closed by Banks in the near term. Moreover the access to capital markets in order to meet these specialized financing needs has become more risky today, as many financial insurers providing risk mitigation to investors in high risk securities have been downgraded (as in the case of mono-line insurers MBIA and Ambac) or are not active in the credit derivative markets (as in the case of AIG).

## 7. The expected losses of the financial sector and the USA banks

If it is clear that there is a growing role for banks in expanding credit to the economy, it is becoming also apparent that the crisis is taking a large tall on their capital base and risk-taking capacity. The issue for

[17] Hedge Funds reached a peak of $1.868 trillion assets under management in June 2008; by October 2008 this total was falling to $1.564. See Gregory Zuckerman,Jenny Strasburg, "For Many Hedge Funds, No Escape", The Wall Street Journal, Friday, January 2nd ,2009 – Year-End Review of Markets & Finance.

banks is their limited capital following an extended series of right-offs[18], which are estimated to have reached $850 billion at the end of 2008 – only for the portion pertaining to US banks – and put serious constraints to their ability to expand amid lingering doubts over the quality of their assets. The gravity of the situation prompted the latest round of initiatives announced on March 23rd to address the issue of "toxic assets" by launching a Private-Public Partnership to buy back these assets from the market by offering both equity and working capital to take these assets off the banks' balance sheet. As the issue of bank capitalization is at the center of the current policy action by Treasury Secretary Tim Geithner, it is important to review the current estimates concerning expected losses over the 2009-10 and try to determine the potential size of the cleanup exercise required to restore the quality of the banks' balance sheet.

The exercise of assessing the potential losses incurred by financial institutions over the 2009-10 period is subject to a large margin of error that should be clear to the reader. The key consideration supporting the stimates derived in this paper is the continued deterioration of the economic scenario including a further decline in housing prices (-10/15%) and commercial real estate (-30/35%); and a deep decline on economic activity (-4/5%) over the next 18/24 months. These projections are translated with great approximation into market valuations of various classes of securities and in projected defaults on loans currently classified as seriously delinquent in a wide range of credit markets.

With the great caution required, one can read the summary *Table 9* with the following points in mind: (i) the estimates on the residential and commercial mortgage markets are derived from the analysis of Section 4 and 5; (ii) the other estimates are based on the methodology and estimates by Nuriel Roubini and Elisa Parisi Capone, RGE-Monitor of January 2009 – thus, they may incorporate a negative bias in the

[18] Some Analysts Reports by Goldman Sachs identify losses in the order of 9% of Bank assets for cumulative losses of $2.1 trillion between mid 2007 and the end of 2008. Only half of such losses (approximately $1.1 trillion) has been recognized through mark-to-markets and write-offs by EU, USA, and other Banks. The US portion of cumulative Bank write downs was estimated at $850 billion until the end of 2008.

definition of expected losses which includes not only the projected mark-to-market write offs on securities, corporate and consumer and corporate loans, but also the expected defaults at the peak of the crisis – between 2009-10. (iii) some adjustments have been made to incorporate other market information, such as the analysts reports on the write-offs of US banks at the end of 2008.

The main conclusion of *Table 9* is an estimated loss for the whole US Banking sector of $1.6 trillion (versus $1.8 trillion projected by RGE Monitor). If one considers that $850 billion have already been recognized and written-off by US banks at the end of 2008, it follows that the additional losses expected over the 2009-10 period are about $750 billion. Furthermore, by comparing these losses to the value of $1.4 trillion which represents the US Banks Reserves (commercial banks and broker-dealers) in the third quarter of 2008, one can see that the position of the US financial system is very fragile. By breaking down the total loss of $1.6 trillion in loan losses of $ 981 billion and a securities write down of $618.1 billion one can see that even the pure loan loss component is enough to put the US banking system in a very precarious position in the next 18-24 months. The need to recapitalize banks is as urgent as possible for the Obama administration.

While great uncertainty remains on the valuation of securities there is scope for improving the transparency of this market. If the latest US Treasury program to buy back toxic assets is successful, it will hopefully provide the much-needed "price discovery" on the Asset Backed Securities (which are currently illiquid) and lead to some generalized mark down of these securities portfolios. The down side of this scenario is that this could also accelerate the need to intervene by injecting new capital into banks. The time frame for this Government intervention presents an additional challenge for the Obama administration as Congress is still entangled in the Budget discussions and there is no more appetite for *ad hoc* solutions with taxpayer money. Ruling out other interventions such as those in Citibank and other private banks during the past six months – i.e., both due to political considerations and resource constraints – the Obama administration might need to consider more radical and systemic solution such as more bankruptcies/receiverships or the outright nationalization

(i.e., by using the extraordinary regulatory powers that both Bernanke and Geithner have requested to Congress on March 27th).

## 8. The causes of the crisis and the interbank market

Among all interpretations of the current financial crisis the one that we find appealing brings forth the role of mismatching of financial institutions asset and liability which was also at the core of the saving and loan crisis almost two decades ago. The difference in the present crisis is that the mismatch was at the very core of the financial system – not in some specialized intermediaries of limited importance. Thus, when the liquidity crisis appeared in 2007, very soon it became apparent that it could not be confined to one class of intermediaries (such the savings and loans banks) due to high interdependence and correlation among markets via the role of large financial institutions operating as counterparts in multiple trades.

The conditions that made this crisis possible are not only related to financial innovation and the expansion of structured finance and derivative markets, but also to some old fashion issue of bad risk management. The excessive risk taking was made possible by new ways in which financial institutions could "make positions" and borrow short-term funding. The combine effect was a financial crisis leading to a simultaneous collapse of key credit markets such as the interbank markets, the commercial paper market, and ultimately causing a panic that affected even the money market funds, before the whole stock market crumbled in late 2008[19].

To put this argument in perspective one can look at the timeline of the crisis. The fragility at the core of the financial system emerged

[19] See H.P. Minsky (2008), pp. 83-87. Since the total amount of position-making activity is related to the volume of financial assets, the banks need to develop a wide array of position-making instruments – and markets – in order to be able to operate with such low ratios of cash and reserves to total assets. The likelihood that policy actions will bring the economy to the brink of a financial crisis increases with the number of markets used for position-making and with the proportion of bank assets bought through them. Such transactions enhance banks' ability to finance activity, but the financing tends to be short-term. This means that measures allowing bank financing to grow fast will engender more short-term financing of non-bank activity.

in late 2007, as financial institutions started to perceive a possible deterioration in quality and value of asset-backed securities. Lenders started to ask for more collateral and quickly stopped lending to the weakest counterparts – and this brought the liquidity crisis of major broker-dealers such as Bear Stearns. The declining confidence among market participants caused a sudden liquidity crisis across the whole sector. The volume of commercial paper transactions collapsed 35% from the peak of August 2007. The spreads on credit derivatives – i.e., CDS - Credit Default Swaps – widened very rapidly and the fear of default and cross defaults brought these key markets to a halt in the fall of 2008. As suggested by Kenneth N. Kuttner (2008)[20], the race for liquidity in these interbank markets is "the 21st Century equivalent of the old-fashioned bank run and the demand for collateral made to issuers of CDS (such AIG) are analogous to the margin calls of 1929".

To gage the size of the market that provides liquidity to the whole credit system, one can consider the "repurchase agreements or repos market". This market is $1.8 trillion[21] and provides ample space for banks to borrow and lend through collateralized transaction – which are deemed as safe as the quality of the underlying collateral. Equally important is the size of the balance sheet of the institution that has taken a major role in the repo markets, the Federal Reserve: with a balance sheet close to $1.9 trillion,the Fed plays a dominant role in the liquidity creation through a variety of windows of the repo market[22]. On March 19th 2009, Secretary Geithner announced a further dramatic expansion of the FED balance sheet (by up to $1.2 trillion) to allow the purchases of Treasury Bonds, in addition to other mortgage instruments, to lower long-term interest rates, promote mortgage refinancing, and prompt a recovery of the hosing market.

Since the failure of Bear Stearns and Lehman the perception of the repo markets has significantly changed. At this point in time, the heavy

[20] Kenneth N. Kuttner (2008), "The Federal Reserve as Lender of Last Resort during the Panic of 2008", Williams College, MA – Kenneth.n.kuttner@williams.edu.
[21] See Federal Reserve, *Flow of Funds Accounts*, December 2008 - Tables L 207-208).
[22] Starting from 2007, these developments have been analyzed – with a chronology – by Kenneth N. Kuttner (2008), who shows the continuity of Geithner's approach with that of his predecessor, Hank Paulson.

reliance on "repo transactions" for funding the buildup of assets in the balance sheet of brokers-dealers is recognized as a potential source of systemic risk. In a recent interview Ben Bernanke stressed that the use of tri-party repo[23] needs to be better regulated along with the whole repo market. He also hinted at the fact that for investors who place money in low-risk, money market funds may end up taking all kind of credit risk as long as the fund themselves are involved in tri-party transactions and accept to lend money in exchange for collateral in repo transactions. This issue has been muted by the government guarantee on money market funds until April next year. But what are the systemic implications of this colossal expansion of liquidity for the functioning of the financial system?

## 9. Innovation and changing structure of financial systems

The rapid pace of innovation in the financial system has changed its structure and cased endless debate on the basic models of reference such as the "bank-based systems" or European model, and the "market-based systems" or Anglosaxon model[24]. Although these categories are intellectually appealing, they have been considerably blurred in the past decade and all systems have shown a significant degree of convergence with greater role of markets and further shifting toward globalization of financial systems and an expanded size of debt and equity markets across the globe (*Table 10*). These trends can be detected by a simple comparison of the basic feature of the US financial system vis-à-vis the EU and Japan. The US system appears significantly different in terms of volumes of credit generated through securities markets, which reached 216% of GDP in 2007 – the last year for which comprehensive data are available. *Table 10* also shows the rapid

[23] See Michael Mackenzie, "Changes Welcomed for Crucial Area of Finance", *The Financial Times*, 13 March 2009, p. 24. In a repo transaction dealers borrow money from funds and other investors for short periods of time and pledge securities as collateral. In a tri-party transaction a custodian bank acts as agent between the investor and the financial firms seeking short-term funds. The strain in money markets last year highlighted the way many repo investors – who were not allowed to invest directly in low-quality assets – had instead lent money against them as collateral in repo transactions, through tri-party repos.
[24] See BIS Annual Research Conference, 19-20 June 2006.

growth in market intermediation experienced by the USA in the past few years – also thanks to the exponential growth of derivative markets that now approach $62 trillion in volume.

A turning point in this convergence process was reached in late 1990s with the legislation that abolished the Glass-Steagall Act of 1933. The new legislation allowed the development of unregulated derivative markets subject to the self-regulating discipline of key institutions "at the core of the global financial system". These "systemic institutions" were deemed capable (and led by self-interest) to properly measure and manage risk while minimizing their regulatory capital requirements and scaling up their assets – on and off balance sheet – to maximize shareholders value. With hindsight, one can safely argue that the implications of those policy decisions were not fully understood at the time, particularly in terms of the potential losses and exposures allowed to financial institutions.

The risks and potential unintended effects of the world order "post Grass Steagall" became increasingly evident with the exponential growth of derivative and securitization markets. What became clear is that a modern financial order could not control the ballooning of such instruments that expand liquidity and credit creation beyond the reach of Central Banks and regulators – as highlighted by Savona, et. Al.[25] The development of such "internal money"[26] – both among banks and non-bank intermediaries – led to rapid creation of credit in the domestic and international economy. In addition to being beyond the control of central banks and regulators this internal credit and liquidity creation is seen with suspicion for its potential spills over effects into prices of assets, commodities, goods and services. The expansion of ABS and structured products also created a bloated financial sector which included specialized agents involved in originating, servicing, providing risk

[25] Paolo Savona, Chiara Oldani, Rainer Masera and Giancarlo Mazzoni (2008), "Subprime Credits or Subprime Policies? The Derivative Conundrum", in Associazione Guido Carli, *Derivative Risk-Return and Subprime, Sixth Colloquium*, edited by Paolo Savona, Fondazione CESIFIN.

[26] Systemically important financial institutions such as AIG became major providers of credit risk mitigation to markets without regulatory capital but simply relying on the implicit backing and high ratings of other highly capitalized divisions of the same parent companies.

mitigation etc. in the securitization markets. The net effect was a declining role of banks in the credit creation process and massive risk transfer outside the financial system and into institutional and private investors.[27]

The present financial crisis has raised many question not only on deregulation, but also on role plaid by financial innovation and the merits of the market-based, Anglo-Saxon model. What was perceived as a major structural enhancement – i.e., the creation of large financial and capital markets to expand the pool of capital beyond the amount held by banks – turned into a major source of vulnerability. In the public eye, financial innovation may also appear to have favored reckless leveraging and risk taking by a financial industry, mainly to boost its own profitability or to use complex instruments for eluding the reach of regulators and supervisors.

Although these questions remain valid, there are simple considerations concerning the industry structure in which financial innovation was applied: these considerations may explain the fragility of the financial system and eventually its crisis.

- Firstly, there is an issue of vulnerability at the core of the financial system: a few large institutions were allowed to become systemically relevant without any real supervision – particularly those falling under the non-bank financial institutions definition.
- Secondly, these systemically relevant institutions were allowed to play a key role in interbank markets. Thus, they were not only allowed to take large risks without adequate capital – i.e., simply because they were deemed to be "too big to fail"–, but they were also allowed to fund illiquid positions with overnight or very-short-term liquidity. Such a benign treatment provided a host of systemic institutions a powerful engine to expand assets, both on and off balance sheet, and become eventually "too big to manage".
- Thirdly, all financial institutions were allowed to become systemically interdependent through credit derivatives and other markets providing

[27] The Turner Review of March 2009, addresses the issue of credit risk transfer from the balance sheet of banks to financial market investors and makes very critical comments on the IMF-GFSR of April 2006, Exhibit 16, in which it argued that these innovations had made the international financial system more resilient.

protection against losses incurred in various markets. The interdependence was created through transactions among an array of counterparts and intermediaries involved in derivative markets without regulatory capital requirements or supervision. Securitization technology combined with risk mitigation and credit risk protection instruments were at the core of the interdependence among bank and non-bank financial institutions. Although such activities were perceived as an element of risk diversification, in reality they were based on fragile foundations as the collapse of one counterpart could) create a contagion effect on the others – as it did in October 2008 when Lehman collapsed.

## 10. Conclusion

The current financial crisis may be unique in depth, global reach, and for originating in the financial markets of the United States as opposed to some emerging economy, but it may also be related to the "normal working of a capitalist economy with sophisticated, complex, and evolving financial institutions". The work of Hyman P. Minsky provides an enlightening perspective suggesting that the workings of financial markets are naturally prone to causing financial crises.[28]

[28] See Minsky (2008) p.5; "*The economic instability so evident since the late 1960s is the result of the fragile financial system that emerged from cumulative changes in financial relations and institutions over the years following World War II. The unintended and often unnoticed changes in financial relations, and the speculative finance induced by the successful functioning of the economy have made the rules for monetary and fiscal policy based on the experience of the 1950s and the 1960s invalid*". The analysis by Hyman. P. Minsky should be seen in the context of the post-Korean War period of the US economy. But its content highlights the contemporary relevance of Minsky's logical framework, which could just as easily refer to the current crisis in the aftermath of an extended period of growth: "For a new era of serious reform to enjoy more than transitory success it should be based on understanding of why a decentralized market mechanism – the free market of the conservatives – is an efficient way of handling the many details of economic life, and how financial institutions of capitalism…are inherently disruptive. We must develop economic institutions that constrain and control liability structures, particularly of financial institutions and of production processes that use large-scale capital assets. … A capitalist economy cannot be maintained… if it oscillates between threats of imminent collapse of asset values and employment, and threats of accelerating inflation and rampant speculation, especially if the threats are sometimes realized".

Thus, the crisis may depend on inadequate policies and ineffective regulation. The focus on the pre-emptive role of good policies and regulations is particularly important in a period of rapid financial innovation and sustained growth, which may cause psychological effects of "irrational exuberance". Other key considerations have been emphasized by Paolo Savona (2007)[29] on the spill-over effects of macro policies and liquidity creation as catalysts of this crisis.

If the Minsky's perspective is correct to mention the normal working of the capitalist economy in financial crises, there is nothing normal in the circumstances leading to the policy and regulatory failures that were identified as major factors in the current crisis. Massive disequilibria in the USA and international economy plaid a role in the choice of a policy mix based on abundant liquidity creation and complacency in dealing with issues of financial innovations that appeared to help the financial sector in coping with the burden of financing the massive USA current account deficit. Thus, there were complex macroeconomic policy and international coordination issues behind the regulatory failures leading to the financial crisis.

Nevertheless, as the financial crisis unfolds, it is the "logical framework" underpinning the US policies and regulations which is called into question and appears increasingly flawed. Moreover, this crisis is not so much the end of the capitalist economy or the final proof of the corrosive power of financial innovation, but it is simply the end of a self-serving, ideological approach to market regulation which prevailed in the past 10 years. Thus,in addition to the crisis, the Obama administration is also trying to come to grips with the open, although belated admission by Alan Greenspan of the flaws of US policies and regulatory approaches of the past decade. In a speech[30] on February

[29] Paolo Savona (2007), "Derivatives, Money and Real Growth", *Review of Financial Risk Management*, Vol. 3, no. 4, December.
[30] See Alan Greenspan (2009), Economic Club of New York, February 17. The "Maestro" – who played a key role in the policy decisions of late 1990s, including the one not to regulate derivatives – admits that he was caught by surprise by events in the summer of 2007, "when the risk management structure cracked".

2009 the Maestro[31] admitted that he "was deeply dismayed" by discovering the breakdown of his critical premise that "the enlightened self interest of owners and managers of financial institutions would lead them to maintain a sufficient buffer against insolvency by actively monitoring and managing their firms capital and risk position".

Obviously, the USA approach to regulating the financial sector lacked real grip on key markets and business practices that made financial institutions increasingly profitable by taking reckless risk without any disclosure, oversight and accountability for the potential losses. But these practices were more widespread that initially thought,[32] and many important markets / instruments did thrive on multiple-level regulatory failures, amid widespread international regulatory arbitrage, and admittedly poor coordination among regulators of the largest financial markets.[33] How to revamp the regulatory framework of the global economy is the issue, starting from key countries, markets and institutions of systemic importance, including how much to regulate the non-bank activities such as hedge funds, and the critical markets for derivatives and securitization instruments.

The case to preserving financial innovation – i.e., the derivatives and securitization markets – is justified by the fundamental need to spread risk in order to finance risky ventures, but only if transparency and market integrity can be ensured in effective manners.[34] Derivatives and securitization can perform a fundamental role as instruments to catalyze risk taking – which is integral to growth and economic development. Nevertheless, these critically important markets cannot be allowed to

[31] In many ways the unique influence exercised by Alan Greenspan on the US public policy-making cannot be grasped without reference to the rich anecdotal material over his many years at the Fed. Bob Woodward crafted the term "Maestro" in his book: Greenspan's FED and the American Boom, Simon & Schuster, 2000.

[32] Further analyses are needed, but the evidence that the causes of the crisis go beyond the borders of the USA is building up as large exposures of European Banks to real estate, Eastern European countries, real estate and leveraged loans are beginning to surface and renew concerns about the working of financial systems under rapid transformation and yet unable to manage the consequences of rapid innovation.

[33] See comments by Jochen Sanio, President of BaFin, at the "Breackfast Regulatory Dialogue with Government Officials, Institute of International Bankers, (www.iib.org), The Four Seasons Hotel, Washington DC, October 13th, 2008

thrive on glaring US regulatory failures, widespread international regulatory arbitrage, and openly admitted poor coordination among regulators of the largest financial markets.[35]

Addressing the issues presented by the current financial and economic crisis requires a genuine cooperative effort to rectify regulatory frameworks prone to arbitrage, and strengthen generally ineffective national regulators and supervisors across many jurisdictions, well beyond the USA. Many steps and reform may well be needed to address the web[36] of overlapping jurisdictions that increase the need for coordination and may stall efforts to prevent a repeat of the catastrophic failures that we have seen in the past six months. Finding the right balance between "retail and wholesale regulation" is the challenge for the US, the EU, the G7 and the G20 in the months to come.

Concerning the conditions of the USA financial system in the facece of deteriorating economic conditions, crisis in the housing and commercial real estate markets, the analysis carried out shows considerable weakness in the capital structure of banks. The main point is that the US Banking sector appears poised to face a $1.6 trillion loss in the 2008-10 period. If one considers that $850 billion have already been recognized and written-off by US banks at the end of 2008, it follows that the additional losses expected over the 2009-10 period are about $750 billion. Furthermore, by comparing these losses to the value of $1.4 trillion which represents the US Banks Reserves (commercial banks and broker-dealers) in the 3rd quarter of 2008, one can see that the position of the US financial system is fragile. Despite these alarming numbers, the outlook for the industry remains positive as long as the Fed remains on the current path of extremely aggressive monetary policies. By providing

[34] In a thoughtful account of what went wrong, Lloyd Blankfein (2009) – CEO of Goldman Sachs – argued in favor of regulation, but against "wholesale regulation" that would undermine growth.

[35] This point was made by Mario Draghi – Chair of the Financial Stability Forum – See the Financial Times of Friday November 14th, A vision of amore resilient global economy, p 13 and expanded in the Final reports of the G20 Working Group 1 & 2 published on March 25th and 27th 2009 in the G20 Website (http://www.g20.org/366.aspx )

[36] See IMF (2005), Haas Francois, G.De Nicolò, et Al, Euro Area Policies, Selected Issues, Chapter IV-V-VI, IMF, European Department, July 6; pp. 87-178.

abundant liquidity at close to 0% rates, the Fed is helping financial institutions recover profitability e restore reserves. The Obama administration is clearly committed to rebuild confidence in the financial system with a wide set of policies, which includes revamping regulations to restore the credibility of supervisory authorities. Much will be done through industry restructuring through consolidations and adaptations in the business model. The imperative for US bankers is to find new and more effective ways to support economic recovery and restore credibility in the global economy.

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# *Appendix*

## Six months into the US financial crisis: key numbers and lessons

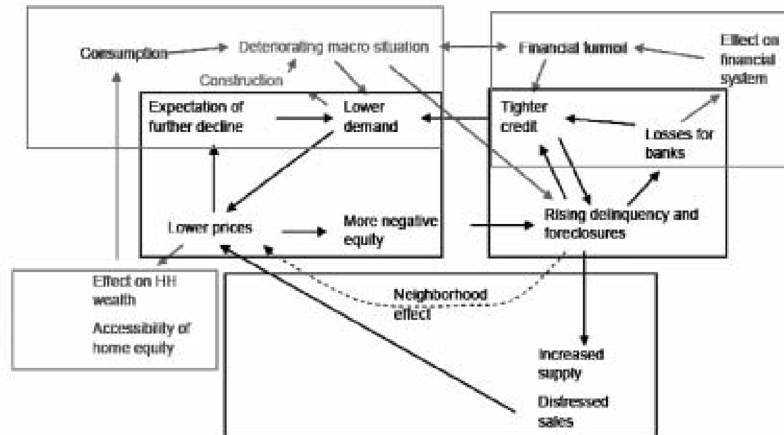
## Legenda

| | |
|---|---|
| ABS | Asset-backed securities |
| AIG | American International Group |
| AIG-FP | AIG Financial Products |
| CDOs | Collateralized debt obligations |
| CDS | Credit default swaps |
| CMBS | Commercial mortgage backed securities |
| FDIC | Federal Deposit Insurance Corporation |
| FHA | Federal Housing Administration |
| IMF GFSR | IMF Global Financial Stability Report |
| GSE | Government sponsored entities |
| LTV | Loan-to-value ratio |
| OTS | Treasury's Office of Thrift Supervision |
| SIVs | Special investment vehicle |
| TARP | Troubled Asset Repurchase Program |

## FIGURE 1: The Adverse-Feedback Loop*

*Phase 4:* Both demand and credit force contraction of production investment: the crisis spreads globally

*Phase 3:* Asset prices collapse; "panic spreads" accelerating losses of household wealth; consumer demand contracts and impact on sales and stock: the real economy starts to suffer.

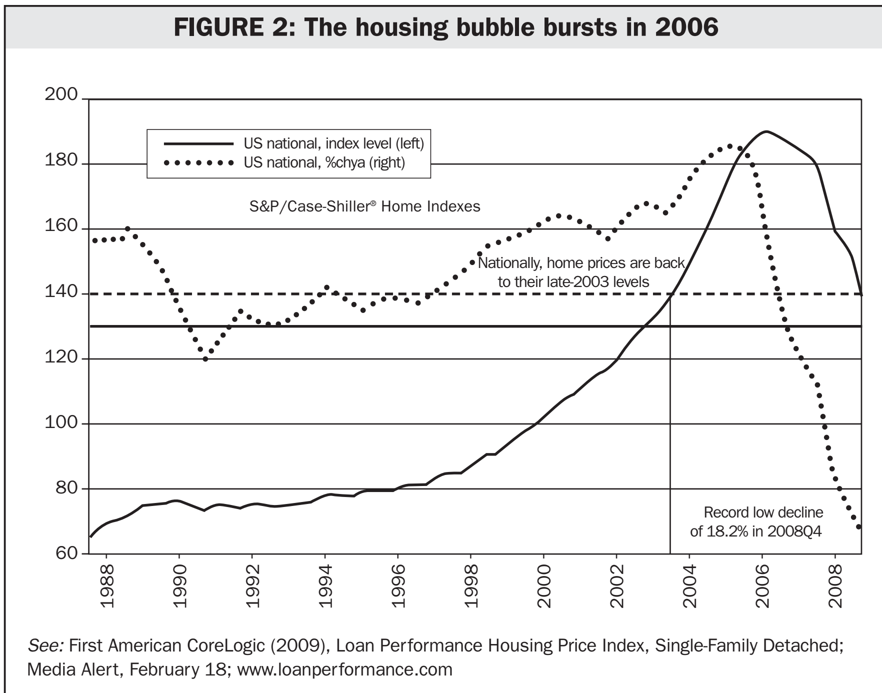



*Phase 2:* Subprime contagion spreads; markets of "toxic assets" freeze; confidence among and in financial inst. collapses;

*Phase 1:* Subprime bubble bursts

*See: John Kiff and Vladimir Klyuev (2009) p. 32.

**FIGURE 2: The housing bubble bursts in 2006**




*See:* First American CoreLogic (2009), Loan Performance Housing Price Index, Single-Family Detached; Media Alert, February 18; www.loanperformance.com

**TABLE 1: Cyclical indicators of the US economy, October 2007-March 2009**

| | GDP Constant prices | | | | GDP Current prices | | | |
|---|---|---|---|---|---|---|---|---|
| | **Billions US$ 2000 prices** | **% Change annualized growth rates** | **Index** | **Cumulative % change from III Q '07** | **Billions US$ 2000 prices** | **% Change annualized growth rates** | **Index** | **Cumulative % change from October '07** |
| III-Q 2007 | 11,627 | 4.80% | 100.00 | 0.0% | 13,941 | 6.37% | 100.00 | 0.0% |
| IV-Q 2007 | 11,621 | -0.20% | 99.95 | 0.0% | 14,031 | 2.59% | 100.65 | 0.6% |
| I-Q 2008 | 11,646 | 0.90% | 100.17 | 0.2% | 14,151 | 0.90% | 101.51 | 1.5% |
| II-Q 008 | 11,727 | 2.80% | 100.87 | 0.9% | 14,295 | 2.80% | 102.54 | 2.5% |
| III-Q 2008 | 11,712 | -0.50% | 100.74 | 0.7% | 14,413 | -0.50% | 103.38 | 3.4% |
| IV-Q 2008 | 11,525 | -6.20% | 99.13 | -0.9% | 14,200 | -6.20% | 101.86 | 1.9% |
| I-Q 2009 consensus forecast | 11.380,9 | -5.00% | 97.89 | -2.1% | 13,979.0 | -6.24% | 100.27 | 0.3% |

| | Housing prices Case-Shiller Composite Index 20 Cities | | | | Stock Market - DowJones Industrial | | |
|---|---|---|---|---|---|---|---|
| | **Index** | **% Change** | **Cumulative % changes from October '07** | | **Closing average End of Month** | **% Change** | **Cumulative % changes from October '07** |
| Oct - 07 | 191.78 | -3.55% | 0.0% | | 14,087.5 | 5,07% | 0.0% |
| Dec -07 | 185.35 | -3.35% | -3.4% | | 13,264.8 | -5,84% | -5.8% |
| Mar-08 | 173.77 | -6.25% | -9.4% | | 12,302.5 | -7,25% | -12.7% |
| Jun - 08 | 167.27 | -3.74% | -12.8% | | 11,350.0 | -7,74% | -19.4% |
| Oct - 08 | 157.11 | -6.07% | -18.1% | | 10,831.1 | -4,57% | -23.1% |
| Dec - 08 | 150.99 | -3.90% | -21.3% | | 8,776.4 | -18,97% | -37.7% |
| Mar - 09 forecast | 148.73 | -6.00% | -22.5% | March 20th Close | 7,278.4 | -17,07% | -48.3% |

*Sources:* Bureau of Economic Analysis - US Department of Commerce, February 27,2009 - *The Wall Street Journal* - Dow Jones, On-line Data Base March 20, 2009. The S&P/Case-Shiller Home Price Indexes, February 24, 2009

**TABLE 2: Impact of a 25% decline in asset values on the US Household Sector balance sheet**

| Main aggregates | Actual 2008 | Simulation of a 25% decline in asset values | Implied loss of value | Mark-to-market discount | Multiplier |
|---|---|---|---|---|---|
| | Amounts in billions US$ | | | | |
| **Tot. Tangible Assets** | **24.905** | **18.679** | **-6.226** | **25.0%** | **75.0%** |
| Residential property | 18.335 | 13.751 | -4.584 | 25.0% | 75.0% |
| Other assets | 6.570 | 4.927 | -1.642 | 25.0% | 75.0% |
| **Total Financial Assets** | **37.170** | **30.119** | **-7.051** | **19.0%** | **81.0%** |
| Cash &ST assets | 8.966 | 8.966 | 0 | 0.0% | 100.0% |
| Securities | 22.702 | 17.027 | -5.676 | 25.0% | 75.0% |
| Equities | 5.502 | 4.127 | -1.376 | 25.0% | 75.0% |
| **Total Liabilities** | **-10.598** | **-10.598** | **0** | **0.0%** | **100.0%** |
| Loans & advances | -239 | -239 | 0 | 0.0% | 100.0% |
| Mortgages | -10.360 | -10.360 | 0 | 0.0% | 100.0% |
| **Total Assets (TA)** | **62.075** | **48.798** | **-13.277** | | |
| | | | | | |
| **Total Liabilities (TL)** | **-10.598** | **-10.598** | **0** | | |
| | | | | | |
| **Net Worth (TA-TL)** | **51.477** | **38.200** | **-13.277** | | |
| | | | | | |
| **Leverage (TL/TA)** | **-17.07%** | **-21.72%** | **27.2%** | **Increase in leverage** | |

USA Household Sector balance sheet - Dec 2008; *Source:* Based on of data from US Federal Reserve, *Flow of funds*, IV Quarter 2008 - Table B100.

**TABLE 3: Estimated Net Home Equity Position of Highly Indebted Households - USA / California - 2008-2010**

*(Scenario of 10% reduction of home prices in 2008 and further 10-15% reduction in 2009-10)*

| Indicators of the Residential Mortgage Market | USA Data[1] | | California Data[1] | |
|---|---|---|---|---|
| Value of Mortgages held by Households in "Negative Equity Position" (PINN) | 1,578 | | 539 | |
| Value of Mortgages held by Households in Position of "Negative Equity and Quasi Negative Equity" (PINN+QN) | 1,988 | | 616 | |
| Value of Property held by Household in "Negative Equity Position"(PINN) | 2,338 | | 769 | |
| Value of Property held by Household in "Negative and Quasu Equity Position" (PINN+QN) | 2,946 | | 880 | |
| **End-2008 SCENARIO: Estimated Negative Equity Position (PINN) of Highly Indebted Households** | | | | |
| Assuming these Households had an "LTV" = 100% at the end 2007 and that house prices fell 10% in 2008 => the Average Value of their Mortgage at the end 2008 = 110% of Home Value (LTV = 110%); (average US$ value) | 309,424 | | 445,051 | |
| Assuming that 70% of Households in Negative & Quasi Negative Equity Position were "highly indebted"; (units #) | 7,330,063 | | 1,522,469 | |
| Value of Mortgages held by Highly Indebted Households | 2,268 | 100.0% | 678 | 100.0% |
| Value of Home property held by Highly Indebted Households | 2,062 | 110.0% | 616 | 110.0% |
| **Net Equity of Highly Indebted Households** | **-206** | **-9.1%** | **-62** | **-9.1%** |

*continue*

*continued*

## TABLE 3: Estimated Net Home Equity Position of Highly Indebted Households - USA / California - 2008-2010

*(Scenario of 10% reduction of home prices in 2008 and further 10-15% reduction in 2009-10)*

| **End 2009-10 SCENARIO: Estimated Negative Equity Position (PINN) of Highly Indebted Households** | **USA estimate - end of 2009-10 leveraged home owners in the USA** | | **California estimate - end of 2009-10 leveraged home owners in California** | |
|---|---|---|---|---|
| Assuming that house prices fell another 10-15% => the Average Value of the Mortgage held by Highly Indebted Households at the end of 2009-10 = 130% of Home Value (LTV=130%) => the average US$ value of Homes is estimated at .... | 239,101 | | 343,903 | |
| Value of Home property held by Highly Indebted Households | 1,753 | 77.3% | 524 | 77.3% |
| **Net Equity of Highly Indebted Households** | **-515** | **-22.7%** | **-154** | **-22.7%** |
| % of loss due to California | 100.00% | | 29.87% | |

[1] Billion US$ except the avarage values of Household Mortgages, Homes, and number of Highly Indebted Households

*Source:* Elaborations on Data by First American Core Logic- Data relase of March 4th 2009.

**TABLE 4: US mortgage market: issuers, underwriters and credit instruments - December 2008 data**

| | Total | Home | Multifamily residential | Total residential | Commercial | Farm | Total residential |
|---|---|---|---|---|---|---|---|
| **Mortgage market (liability side)** | **14,640** | **11,030** | **900** | **11,930** | **2,599** | **111** | **2,710** |
| Household sector | 10,698 | 10,454 | 0 | 1,045 | 244 | 244 | |
| Corporate sector | 1,041 | 33 | 40 | 72 | 968 | 968 | |
| Other holders | 2,902 | 655 | 860 | 1,515 | 1,386 | 1,386 | |
| **Mortgage holders (asset side)** | **14,640** | **11,030** | **900** | **11,930** | **2,599** | **111** | **2,710** |
| Commercial banks | 3,841 | 2,293 | 214 | 2,507 | 1,335 | 0 | 1,335 |
| Savings institutions | 860 | 667 | 65 | 733 | 128 | 0 | 128 |
| Insurance companies | 342 | 17 | 53 | 70 | 272 | 0 | 272 |
| **GSE - Gov. sponsored entities** | **699** | **462** | **189** | **651** | **47** | **0** | **47** |
| Agency &GSE- backed pools | 4,965 | 4,811 | 149 | 4,960 | 0 | 0 | 0 |
| ABS Issuers - Private Label | 2,585 | 1,839 | 115 | 1,953 | 632 | 0 | 632 |
| REITs | 89 | 50 | 4 | 54 | 35 | 0 | 35 |
| Finance Co. | 448 | 376 | 6 | 381 | 67 | 0 | 67 |
| Other (Pension funds et at.) | 810 | 516 | 105 | 621 | 84 | 111 | 195 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Summary: Total mortgages held by** | **14,640** | **100.0%** | **11,030** | **900** | **100.0%** | **2,599** | **111** | **100.0%** |
| Financial sector | 5,044 | 34.5% | 2,977 | 332 | 27.7% | 1.734 | 0 | 64.0% |
| Public agencies | 5,664 | 38.7% | 5,273 | 339 | 47.0% | 47 | 0 | 1.7% |
| Privately sponsored ABS | 3,122 | 21.3% | 2,264 | 125 | 20.0% | 733 | 0 | 27.1% |
| Other (pension funds et at.) | 810 | 5.5% | 516 | 105 | 5.2% | 84 | 111 | 7.2% |

*Source:* Based on of data from US Federal Reserve, *Flow and Funds*, IV Quarter - Tables L 210-220 and L1124-128.

**TABLE 5: Potential Losses in the Residential and Commercial Mortage Portfolios of the US Financial System - 2009-10**

| | Outstanding Mortgages (billion US$) | Numbers of Mortgages (estimated) | Average Mortage Value (US$) or % of total Outstanding Morgages | Cancelations on Mortgage Portfolios in Mid 2008 (IMF-GFSR, Sept. 08 (billion US$) | Additional Cancelations/ Losses expected by 2009-10 (billion US$) | Additional Cancelations/ Losses expected by 2009-10 (% Mortgages in Arrear) | Total Cancelations/ Losses expected over 2009-10 (see[1,2]) (billion US%) |
|---|---|---|---|---|---|---|---|
| ***Line 1*** **- Total Mortgage Market** | | | | | | | |
| SubPrime | 936 | 5,700,000 | 164,211 | n.a. | n.a. | n.a. | n.a. |
| Alt-A | 871 | 2,528,977 | 344,408 | | | | |
| Jumbo | 1,725 | 3,095,642 | 557,235 | | | | |
| Prime - Conforming | 8,398 | 43,803,604 | 191,724 | | | | |
| **Total** | **11,930** | **55,128,223** | **216,408** | | | | |
| ***Line 2*** **- Delinquent and Seriously Delinquent Mortgages in mid 2008** | | | | | | | |
| **Key Assumptions** | | | | | **Writeoffs / Expected Losses = 80% Mortgages in Arrear** | | |
| SubPrime | 253 | 1,540,000 | 27.02% | 50 | 162 | 83.95% | n.a. |
| Alt-A | 227 | 660,000 | 26.10% | 35 | 154 | 83.08% | |
| Jumbo | 86 | 154,782 | 5.00% | | 69 | 80.00% | |
| Prime - Conforming | 292 | 1,525,218 | 3.48% | 85 | 166 | 85.81% | |
| **Total** | **859** | **3,880,000** | **7.20%** | **170,0** | **551** | **83.96%** | **721** |
| ***Line 3*** **- Mortgages in Negative Equity Position (PINN) in Dec.2008** | | | | | | | |
| **Key Assumptions** | | | | | **Writeoffs/Expected Losses = 50% of Seriously Delinquent Mortgages** | | |
| **Total** | **959** | **4.431.496** | **8,0%** | **n.a.** | **480** | **50,00%** | **n.a.** |

*continue*

*continued*

**TABLE 5: Potential Losses in the Residential and Commercial Mortage Portfolios of the US Financial System - 2009-10**

| | Outstanding Mortgages (billion US$) | Numbers of Mortgages (estimated) | Average Mortage Value (US$) or % of total Outstanding Morgages | Cancelations on Mortgage Portfolios in Mid 2008 (IMF-GFSR, Sept. 08 (billion US$) | Additional Cancelations/ Losses expected by 2009-10 (billion US$) | Additional Cancelations/ Losses expected by 2009-10 (% Mortgages in Arrear) | Total Cancelations/ Losses expected over 2009-10 (see[1,2]) (billion US%) |
|---|---|---|---|---|---|---|---|
| ***Line 4* - Mortgages in Quasi Negative Equity Position (PINN) by Dec.2008** | | | | | | | |
| **Key Assumptions** | | | | | **Writeoffs/Expected Losses = 25% of Seriously Delinquent Mortgages** | | |
| **Total** | **467** | **2.160.023** | **3,9%** | **n.a.** | **117** | **25.00%** | **n.a.** |
| ***Line 5* - TOTAL Losses Expected on Delinquent and Seriously Delinquent Mortgages, Negative and Quasi Negative Equity Position by 2009-10** | | | | | | | |
| **Key Assumptions** | | | | | **Writeoffs/Expected Losses = 25% of Seriously Delinquent Mortgages** | | |
| **Total** | 11,930 | | 100.0% | 170 | 1,147 | 11.04% | 1,317 |
| of which: | | | | | | | |
| US Fin.Sector Mortgage Loans | 3,310 | | 27.7% | 170 | 318 | 4.09% | 488 |
| Agency and GSE Sponsored ABS | 5,611 | | 47.0% | | 540 | 4.52% | n.a. |
| Private Sector ABS | 2,389 | | 20.0% | | 230 | 1.93% | 140 |
| Others | 621 | | 5.2% | | 60 | 0.50% | n.a. |

[1] Only part of losses pertaining to US Banks and Investors; note that 39% of total mortage securities sold in financialmarkets is originated in the USA, but sold to non-residents.

[2] 92.8% of the total volume of mortgage loans of the Financial Sector is held by US Banks

[3] 80% of gross volume of Private Pools of morgage loans held by the Financial Sector is held by US Banks

*Source*: Elaborations of data by First American Core Logic, the IMF ( Global Financial Stability Report Sep.2008and J.Kiff and V.Kliuef Tab 3 - pp.25-26)

*See also*: Dina El Boghdady and Sarah Cohen, The Growing Forclosure Crisis, The Washington Post, Saturday 17 January, 2009 A1-A8

**TABLE 6: Impact of a 50% decline in Asset Values on the US business Sector balance sheet- December 2008**

| Balance Sheet Main aggregates | Actual 2008 | Simulation of a 50% decline in asset values | Implied Loss of value | Mark To Market Discount | Mark To Market Multiplier |
|---|---|---|---|---|---|
| **Tot. tangible assets** | **14,228** | **7,114** | **-7,114** | **50.0%** | **50.0%** |
| Res. property | 8,397 | 4,199 | -4,199 | 50.0% | 50.0% |
| Equipment | 4,083 | 2,041 | -2,041 | 50.0% | 50.0% |
| Inventories | 1,748 | 874 | -874 | 50.0% | 50.0% |
| **Tot. financial assets** | **7,308** | **3,890** | **-3,419** | **46.8%** | **53.2%** |
| Cash & ST assets | 656 | 656 | 0 | 0.0% | 100.0% |
| Consumer credit | 56 | 28 | -28 | 50.0% | 50.0% |
| Trade receivables | 185 | 92 | -92 | 50.0% | 50.0% |
| Other financial assets | 6,412 | 3,206 | -3,206 | 50.0% | 50.0% |
| **Tot. liabilities** | **-6,147** | **-6,147** | **0,0** | **0.0%** | **100.0%** |
| Credit market Instruments | -909 | -909 | 0,0 | 0.0% | 100.0% |
| Bank loans | -704 | -704 | 0,0 | 0.0% | 100.0% |
| Mortgages | -998 | -998 | 0,0 | 0.0% | 100.0% |
| Securities & corporate Bonds | -3,536 | -3,536 | 0,0 | 0.0% | 100.0% |
| **Total assets** | **21,536** | **11,003.7** | **-10,532.8** | | |
| **Total liabilities** | **-6,147** | **-6,146.5** | **0.0** | | |
| **Net worth (TA-TL)** | **15,390** | **4,857.2** | **-10,532.8** | | |
| **Leverage (TL/TA)** | **-28.54%** | **-55.86%** | **95.7%** | **<= Increase in leverage** | |

*Source:* Based on of data from US Federal Reserve, *Flow of Funds,* IV Quarter 2008 - Table B102.

**TABLE 7: USA credit market debt outstanding**

| | Assets | Liabilities | Balance | |
|---|---|---|---|---|
| **Non Financial Sector** | **5,945.1** | **33,517.9** | **-27,572.8** | |
| Households | 3,876.4 | 13,821.0 | -9,944.6 | |
| Business | 171.1 | 7,103.7 | -6,932.6 | |
| Government | 1,897.6 | 12,593.2 | -10,695.6 | |
| Banking Sector | 12,167.7 | 2,021.4 | 10,146.3 | |
| Commercial banks | 9,439.5 | 1,421.7 | 8,017.8 | |
| Savings banks | 1,310.4 | 411.5 | 898.9 | |
| Credit unions | 700.4 | 45.0 | 655.4 | |
| Brokers/Dealers | 717.4 | 143.2 | 574.2 | |
| **Institutional investors** | **10,711.5** | **45.0** | **10,666.5** | |
| Life insurance | 2,891.1 | 45.0 | 2,846.1 | |
| Property Casualty Ins. | 827.0 | 0.0 | 827.0 | |
| Money Market Funds | 2,672.3 | 0.0 | 2,672.3 | |
| Mutual Funds | 2,278.1 | 0.0 | 2,278.1 | |
| Closed end Funds | 130.9 | 0.0 | 130.9 | |
| Exchange Traded Funds | 54.7 | 0.0 | 54.7 | |
| State & Local Retirement Funds | 796.1 | 0.0 | 796.1 | |
| Federal Government Retirements | 120.3 | 0.0 | 120.3 | |
| Private Pension Funds | 941.0 | | | |
| **Securities Market** | **14,950.9** | **15,150.1** | **-199.2** | |
| GSE Gov. Sponsored Entities | 2,992.4 | 3,224.1 | -231.7 | |
| Agency & GSE backed Mort. | 4,965.1 | 4,965,1 | 0.0 | |
| ABS Issuers - Private Label | 3,968.0 | 4.061.1 | -93.1 | |
| REITS | 187.9 | 377.4 | -189.5 | |
| Finance Companies | 1,779.4 | 1,272.3 | 507.1 | |
| Funding Corporations | 1,058.1 | 1,250,1 | -192.0 | |
| **Monetary Authority** | **986.7** | **0.0** | **986.7** | |
| Domestic Assets/Liabilities | 44,761.9 | 50,734.4 | -5,972.5 | |
| **Rest of the World** | **7,830.7** | **1,858,3** | **5,972.4** | **39%**[1] |
| Total Assets/Liabilities | 52,592.6 | 52,592.7 | 0 | |

*Source:* Federal Reserve, *Flow of Funds* IV Quarter 2008 - Table L1.
[1] The % of net assets of the rest of the world on gross volume of mortgages and securities sold in capital markets and originated in the USA.

**TABLE 8: Assets of US banks as a % of Total US financial sector exposed to potential losses and writedowns in 2009-2010**

(Latest estimates of outstanding assets of the US financial sector - Billion US$)

| | Total financial Institutions | Tot.US Banks in % Tot. Fin. Inst. | US banks | Commercial banks | Broker dealers | Saving & Loans | Credit unions |
|---|---|---|---|---|---|---|---|
| **Total for Loans** | **12,530,6** | **84.7%** | **10,607,4** | **8,514.1** | **216.3** | **1,154.4** | **722.6** |
| Residential Mortgages | 5,069.0 | 99.6% | 5,049,2 | 3,841.3 | 0.0 | 860.3 | 347.6 |
| Commercial Real Estate Mortgages | 1,931.8 | 82.8% | 1,599,6 | 1,334.5 | 0.0 | 127.7 | 137.4 |
| Consumer Loans | 1,687.5 | 71.3% | 1,202,4 | 878.5 | 0.0 | 86.3 | 237.6 |
| Corporate Loans | 3,842.3 | 71.7% | 2,756,2 | 2,459.8 | 216.3 | 80.1 | 0.0 |
| **Total for Securities** | **10,558.2** | **66.5%** | **7,017,8** | **5,014.8** | **1,476.5** | **374.1** | **152.4** |
| ABS, ABS-CDO or CMO based on Private Pools of Mgs | 1,952.1 | 80.9% | 1,578,7 | 1,168.2 | 242.6 | 167.9 | 78.6 |
| Commercial Re Mgs.=CMBS/REIT | 755.9 | 0.0% | 0.0 | | | | |
| ABS Issuers - Consumer Credit Based | 654.7 | 0,0% | 0.0 | | | | |
| Agency/GSE Backed Securities (net)[1] | 3,013.0 | 0,0% | 0.0 | | | | |
| Corporate Debt (High Grade & High Yield) | 4,182,5 | 29.2% | 1,221.4 | 988.6 | 128.2 | 104.6 | 25.2 |
| Other/Miscellaneous Assets Loans | | | 4,065.3 | 2,858.0 | 1,105.7 | 101.6 | 48.6 |
| **TOTAL LOANS + SECURITIES** | **23,088.8** | **76.3%** | **17,625.2** | **13,528.9** | **1,692.8** | **1,528.5** | **875.0** |

(1) Agency and GSE backed securities include issues of federal budget agencies; those of government sponsored enterprises - sush as Fannie Mae e FHLB - and GSE backed mortage pools issued by GNMA, Freddie Mac, and the Farmers Home Administration.
*Memo:* ABS: asset-based securities; CMBS: commercial mortgage-backed securities; REITs: real estate investment trusts; GSE:Government-sponsored enterprises; *CMO:* collateralized mortgage obligations; Agency: Federal government agencies involved in housing, such as FHA Federal Housing Administration.

*Source:* Based on the "Federal Reserve Statistical Release: *Flow of Funds* Account of the USA - Flows and Outstandings - IV-Quarter 2008", C27.
Board of Governors of the Federal Reserve System, Washington DC, 20551 - 12 March 2008.

## TABLE 9: Asset of the US financial sector exposed to potential losses and writedowns in 2009-2010

| Year-end assets in billions of US$ | Data from US-Fed, Flow of Funds, Mar 2009 | | | Previous Estimates IMF-GFSR Sep.2008 | | |
|---|---|---|---|---|---|---|
| | **Outstanding** | **Estimated losses US$*** | **Estimated losses %** | **Outstanding** | **Estimated losses US$** | **Estimated losses %** |
| **TOTAL FOR LOANS** | **12,531** | **1,354** | **10.8%** | **12,370.0** | **425,0** | **3.4%** |
| Residential mortgages | 5,069 | 488 | 9.6% | 4700 | 170 | 3.6% |
| Commercial real estate mortgages | 1,932 | 160 | 8.3% | 2400 | 90 | 3.8% |
| Consumer Loans | 1,688 | 287 | 17.0% | 1400 | 45 | 3.2% |
| Corporate Loans | 3,670 | 367 | 10.0% | 3700 | 110 | 3.0% |
| Leveraged Loans | 173 | 52 | 30.0% | 170 | 10 | 5.9% |
| **TOTAL FOR SECURITIES** | **10,558** | **1,398** | **13.2%** | **10,840** | **980** | **9.0%** |
| ABS, ABS-CDO or CMO based on Private Pools of Mgs. | 1,952 | 683 | 35.0% | 1,500.0 | 500 | 33.3% |
| Commercial RE Mgs.= CMBS / REIT | 756 | 140 | 18.5% | 940.0 | 160 | 17.0% |
| ABS Issues - Consumer Credit Based | 655 | 131 | 20.0% | 650.0 | 0 | 0.0% |
| Agency/GSE Backed Securities (net)** | 3,013 | 151 | 5.0% | 3,800.0 | 80 | 2.1% |
| Corporate Debt (High Grade & High Yield) | 4,183 | 293 | 7.0% | 3,950.0 | 240 | 6.1% |
| **TOTAL LOANS + SECURITIES** | **23,089** | **2,751** | **11.9%** | **23,210** | **1,405** | **6.1%** |
| Portion of losses borne by US banks (see) | | 981[3] | | | | |
| Portion of securities losses borne by US banks | | 618[1]& [2] | | | | |
| Expected cumulative losses on bank loans & securities | | 1,599 | | | | |

* Estimates by the author taking into account data provided by RGO Monitor Jan 20, 2009.

** Agency and GSE backed securities include issues of federal budget agencies; those of government sponsored enterprises - such as Fannie Ma and FHLB - and GSE - backed mortgage pools issued by GNMA, Freddie Mac, and Farmers Home Administration.

*Memo:* ABS: asset-based securities; CMBS: commercial morgage-backed securities; REITs: real estate investment trusts; GSE:Government-sponsored enterprises; CMO: collateralized mortgage obligations; Agency: Federal Government agencies involved in housing such as FHA Federal Housing Administration, etc.

[1] 39% of morgage securities sold in capital markets and originated in the USA are sold to non residents.

[2] 66.5% of gross volume of outstanding securities help by the financial sector is held by US Banks.

[3] 72.5% of gross volume of outstanding consumer and corporate loans made by financial sector is held by US Banks.

*Source:* FMI- GFSR, Sett. 08. Based of Fed, Flow of Funds, Mar-09.

**TABLE 10: Bank vs. market based financials systems: main sources of financing (bill. US$ outstanding)**

| | | Bank credit | Debt securities | | | Stock markets | GDP |
|---|---|---|---|---|---|---|---|
| | | | Total | Public | Private | Capitalisation | Current Prices |
| **USA** | **2007** | **11,194.0** | **29,879.3** | **6,594.1** | **23,285.2** | **19,922.3** | **13,807.6** |
| % GDP | 2007 | 81% | 216% | 48% | 169% | 144% | |
| | 2005 | 92% | 163% | 112% | | | |
| | 1999 | 80% | 150% | 150% | | | |
| **Area Euro** | **2007** | **30,137.1** | **23,023.8** | **7,612.6** | **15,411.2** | **10,040.1** | **12.202.6** |
| % GDP | 2007 | 247% | 189% | 62% | 126% | 82% | |
| | 2005 | 154% | na | | | 59% | |
| | 1999 | 122% | na | | | 74% | |
| **Japan** | **2007** | **7,839.4** | **9,217.5** | **7,147.7** | **2,069.8** | **4.663.8** | **4,381.6** |
| % GDP | 2007 | 179% | 210% | 163% | 47% | 106% | |
| | 2005 | 150% | 200% | | | 94% | |
| | 1999 | 161% | 134% | | | 104% | |

*Source*: International Monetary Fund (IMF) 2008, *Global Financial Stability Report*, *World Economic and Financial Surveys* (Washington, September) Bank for International Settlement (BIS) 2006, "The Banking System in Emerging Economies: How Much Progress Has Been Made?" BIS Paper No 28 Monetary and Economics Department, August - TableA2 - Sources of Finance in Emerging Markets p. 34.