

Global Financial Crisis and its Implications to the Business Model and Risk Management in Banking

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Abstract: The recapitalisation and partial nationalisation of several big banks and other financial institutions in September and October 2008 was the official acknowledgment that the world financial system is seriously ill. The two main symptoms of this illness are 1) *the excessive leverage in the banks and shadow banking system* and 2) *many financial institutions experience liquidity and solvency problems*. The obvious cure for stated illness would be the reduction in debt within financial system (deleveraging) and various forms of reorganization aimed to decreasing financial system's operating costs. The inevitable future consequence will be the reduction of the share of financial services within countries' GDP. This process has already started in ad hoc manner through the bankruptcies and bailouts of several major financial institutions in USA and Europe. In order to assure execution of this process in a more organized and less chaotic way, governments of the USA and some European countries devised blueprints, policies, legislation and allocated substantial budget resources towards helping the banking sector. However, many details about practical implementation of government actions are not yet worked out. At the moment necessary liquidity support and capital injections to banks are starting to be delivered. In the medium and long term it will be necessary to overhaul business model, regulation and risk management practices in banks and other financial organizations. The prerequisite for doing this is a deep knowledge about causes and consequences of global financial crisis. The obvious initial trigger of the crisis was the subprime lending in the USA, but there are many other factors which contributed. Usual scapegoats or 'suspects' are, among others: *subprime borrowers, lenders and brokers, rating agencies, deregulation, Basel II, Alan Greenspan, American presidents Bush and Clinton, mark-to-market accounting, securitization, credit derivatives, originate and distribute business model etc.* Although in a sense all abovementioned factors contributed to the financial crisis, their adverse effect could be easily avoided or at least mitigated by the use of proper corporate governance methods and risk management techniques. The big question is *why banks, especially big international banks, failed to use readily available risk management techniques, which would enable them to avoid exposure to subprime mortgages and mortgage backed securities*. Ongoing financial crisis also exposes weak points of bank business models, especially *broker dealer model* of big investments banks. The similar problem share all commercial and mortgage banks which are financed mainly by means of short term deposits on the wholesale market. In the paper some possible changes in bank business model shall be investigated

WHICH CRISIS?

**The ongoing crisis is not only
*Global Financial and Economic Crisis 2007-20??***

**But also, at least to some extent:
*Social Crisis; Crisis of Knowledge and Ideas; Crisis of
Capitalism; Leadership Crisis (on Corporate as well as
Country Level); Corporate Governance Crisis etc.***

How to Cope with the Crisis?

***A multidisciplinary approach; coordination between
international organizations, governments, banks and
other financial organizations, nonfinancial companies,
citizens, scientists; First it is necessary to understand
the crisis; Next goals are design and implementation of
efficient solutions. Banks should probably focus their
attention to risk management and its business model.***

SOME QUOTATIONS RELEVANT TO THE CRISIS

‘the diversity of our opinions does not proceed from some men being more rational than others, but solely from the fact that our thoughts pass through diverse channels and the same objects are not considered by all’ (*Rene Descartes, Discourse on method*)

**‘a sound banker, alas, is not one who foresees danger and avoids it, but one who, when he is ruined, is ruined in a conventional and orthodox way with his fellows, so that no-one can really blame him.’
(*John Maynard Keynes, 1931*)**

**‘The salient feature of the current financial crisis is that it was not caused by some external shock like OPEC raising the price of oil. . . The crisis was generated by the financial system itself.’
(*George Soros, 2008*)**

‘international financial institutions are international in life but national in death’ (*Charles Goodhart, 2009*)

THE MAIN CHARACTERISTICS (SYMPTOMS) OF THE CRISIS

- 1) The excessive leverage in the banks and shadow banking system**
- 2) High maturity mismatch (on/off balance sheet)**
- 3) Credit related bubbles: housing, LBO&MBO, commercial real estate etc.**

□ Mechanisms which propagate or enable above symptoms:

**‘Originate and distribute’ banking model; securitization process;
Shadow banking system (SPVs, SIVs, Conduits);
Low interest rates in US at some time periods;
Lax lending standards;
Regulatory capital arbitrage and rating arbitrage;**

Manifestations of the crisis:

**Beginning in the US with ‘subprime mortgage crisis’ and securities derived from subprime mortgages by means of securitization;
These securities appeared also on the balance sheets of EU banks;
Other EU bank’s problems: real estate bubble in some member countries, high exposure to CEE banks, deteriorating macroeconomic data etc.**

CONCEPTUAL (IDEAL) RESOLUTION OF THE CRISIS

The main symptoms of the crisis are connected with excessive indebtedness, high share of financial services and some other industries (e.g. construction, automobile) in world's GDP. This situation can be resolved with more saving, less consumption and consequently less debt in the financial system (deleveraging). Consumption pattern will probably influence changes into more environmental friendly production (smaller automobiles and houses, better public transport etc.)

If current and ideal future situations are denoted with A and B respectively, then the resolution of the crisis can be described by means of the following multiobjective optimization problem:

Move from A to B subject to

Minimization of human suffering;

Minimization of costs to country's budget (current and future taxpayers);

Maximization efficiency of the proces

Additional constraints and objectives

This means, among others, that the acceptable paths from A to B are relatively scarce.

The biggest obstacles to crisis resolution (*De Grauwe, 2009: Keynes's Savings Paradox, Fisher's Debt Deflation and the Banking Crisis, www.voxeu.org*)

Keynesian savings paradox:

When one individual desires to save more, and he is alone to do so, his decision to save more (consume less) will not affect aggregate output. He will succeed to save more, and once he has achieved his desired level of savings he stops trying to save more.

Fisher's debt deflation:

When one individual tries to reduce his debt, and he is alone to do so, this attempt will generally succeed. The reason is that his sales of assets to reduce his debt will not be felt by the others, and therefore will not affect the solvency of others. The individual will succeed in reducing his debt.

Similar logic applies to: ***Cost cutting deflation*** and ***Bank credit deflation***

Paradox: *Collective action to complement above approaches will inevitably fail. If everybody want to deleverage (increase saving or decrease debt), this will lead to reduction of production and country's GDP.*

GLOBAL FINANCIAL ASSETS GROWTH 1990-2007

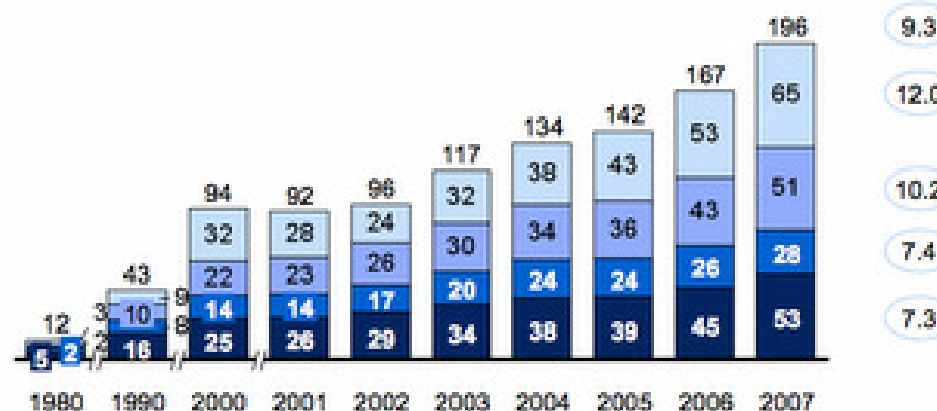
(McKinsey report, March 2009, www.nakedcapitalism.com)

Growing global financial assets fostered increased liquidity and availability of credit

Value of global financial assets
\$ Trillions

■ Equity securities
■ Private debt securities
■ Government debt securities
■ Bank deposits

CAGR 1990-2007
Percent

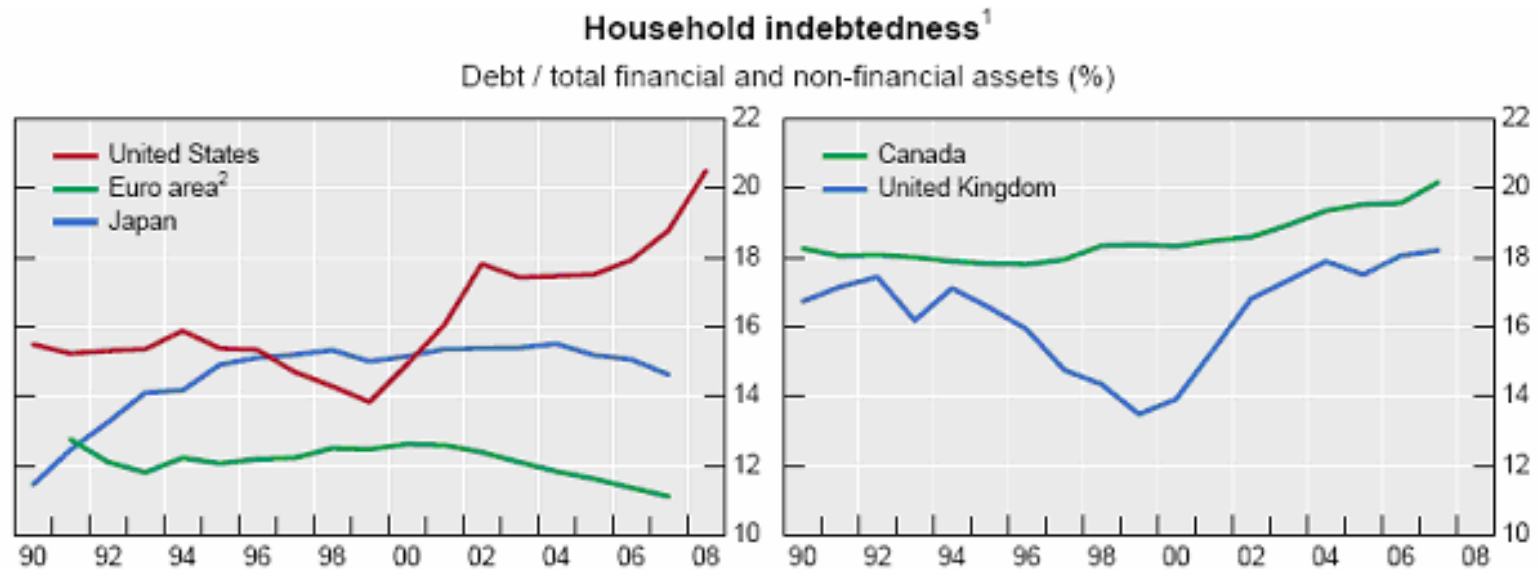


	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007
Global GDP \$ Trillions	10	22	32	32	33	37	42	45	49	55
Financial depth Percent of GDP	109	201	294	290	292	315	321	314	342	359

4

CAGR = Compound Annual Growth Rate (geometric mean)
Financial depth = supply of funds (government + private sector)
High growth in equity and debt securities, lower growth in deposits

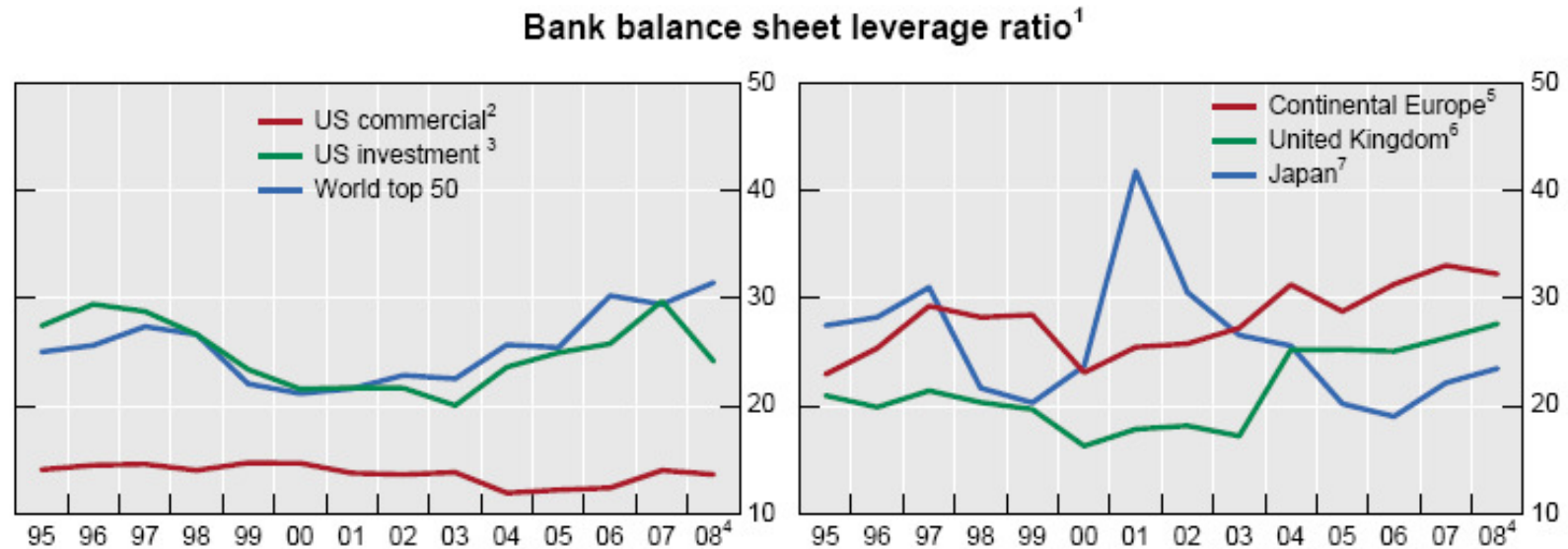
HOUSEHOLD INDEBTEDNESS FROM 1990 TO 2008
(BIS CGFS paper No 34, April 2009, www.bis.org)



¹ Data for 2007 for Japan, Germany and Italy on non-financial assets are estimated using the growth rate of the previous year. 2008 data for the United States refer to the third quarter. ² Weighted average of France, Germany and Italy based on 2005 GDP and PPP exchange rates.

High relative indebtedness in the US and UK, lower in the Euro area

BANK BALANCE SHEET LEVERAGE RATIO FROM 1995 TO 2008
(BIS CGFS paper No 34, April 2009, www.bis.org)



¹ Balance sheet leverage ratio (total assets divided by total equities) of individual banks weighted by asset size. ² Bank of America, Citigroup, JPMorgan Chase, Wachovia Corporation, Washington Mutual and Wells Fargo & Company. ³ Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch and Morgan Stanley. ⁴ Latest quarter. ⁵ ABN AMRO Holding, Banco Santander, BNP Paribas, Commerzbank, Crédit Agricole, Credit Suisse, Deutsche Bank, Société Générale, UBS and UniCredit SpA. ⁶ Barclays, HSBC, Lloyds TSB Group and Royal Bank of Scotland. ⁷ Mitsubishi UFJ Financial Group, Mizuho Financial Group and Sumitomo Mitsui Financial Group.

Bank balance sheet leverage ratio is generally rather high

Market Capitalization and Leverage of Selected Big European and US Banks
(Sources: Bloomberg, Jan 2009; bank annual reports)

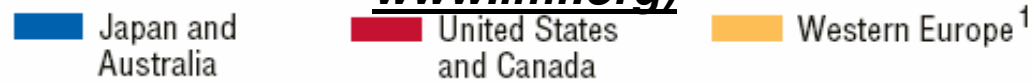
DATE:	MARKET CAPITALIZATION (BN USD)		LEVERAGE
	Q2 2007	20.1.2009	31.12.2007
<i>Citigroup</i>	255	15	19,2
<i>Bank of America</i>	228	33	11,7
<i>HSBC</i>	215	82	18,4
<i>JP Morgan</i>	165	68	12,7
<i>RBS</i>	120	6	20,8
<i>UBS</i>	116	29	63,9
<i>Santander</i>	116	53	17,7
<i>BNP</i>	108	26	31,5
<i>Goldman Sachs</i>	100	28	26,2
<i>Unicredit</i>	93	24	17,7
<i>Barclays</i>	91	7	52,7
<i>Societe Generale</i>	80	19	39,3
<i>Deutsche Bank</i>	76	12	52,5
<i>Credit Suisse</i>	75	22	31,5
<i>Credit Agricole</i>	67	20	34,8
<i>Morgan Stanley</i>	49	13,7	31,7
<i>KBC</i>	35,5	3,5	20,5

- 1) **Jan20 2009 was one of the worst days regarding bank's market value;**
- 2) **Leverage is generally very high; situation in EU is even worse than in US;**

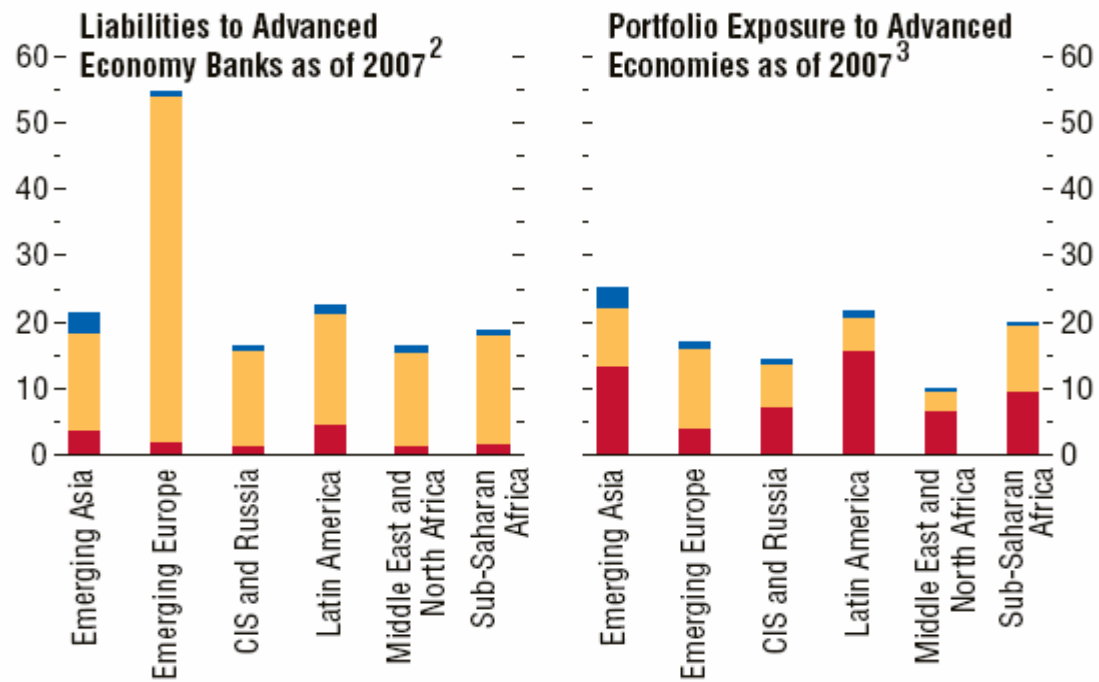
Financial Linkages between Advanced and Emerging Economies

(Source: IMF Economic Outlook 2009 Chapter 4 available at

www.imf.org)



Percent of Emerging Economies' GDP



Possible classifications of bank business models

Bank business model is a way in which bank conducts its business.

There are at least three possible classification of bank business model:

1.DEGREE OF SPECIALIZATION: *Universal banks* and *Specialized banks* (e.g. investment banks, mortgage banks, retail banks...). Universal banks are nowadays accepted as the most flexible model. Another powerful group are specialized investment banks, especially those in USA.

However, ongoing financial crisis exposed weak points of their business model, such as lack of stable sources of financing, high leverage etc.

2.SIZE: This is a relatively new approach to banking models. It is based a) on the observation that the biggest world's banks are 'too big to be saved' and b) their bankruptcy could be a really big trouble for entire global financial system. Recent posts on some financial blogs argued that the size of bank's balance sheet should be limited to max 100 to 300 bn USD.

3.SOME OTHER ASPECT OF THEIR BUSINESS: For example, there are differentiation between 'originate to distribute' and 'originate to hold'. The former model involves the use of securitization, which is supposed to be one of the major causes of ongoing financial crisis,

ON THE ROLE OF SECURITIZATION IN FINANCIAL CRISIS

Securitization is the process of transforming reference portfolio of loans (or some other assets) into specific form of debt security, which can be sold to investors. The process can be represented as a chain of relationships:

Securitization chain:

Sub-prime borrower => mortgage broker => originating bank => mortgage pools => commercial/investment bank => rating agency => SPV => final investors

Shin (Shin,2009:Securitization and Financial Stability, www.princeton.edu) has formulated “Hot Potato Hypothesis“:

Securitization allows “hot potato” of bad debts to pass down chain.

- Chain of principal-agent problems**
- There is a greater fool next in the chain**
- Final investor (e.g. pension fund) is the greatest fool.**

However, in some cases ‘The banking system is the greatest fool’

This can be seen from the table which follows on the next slide.

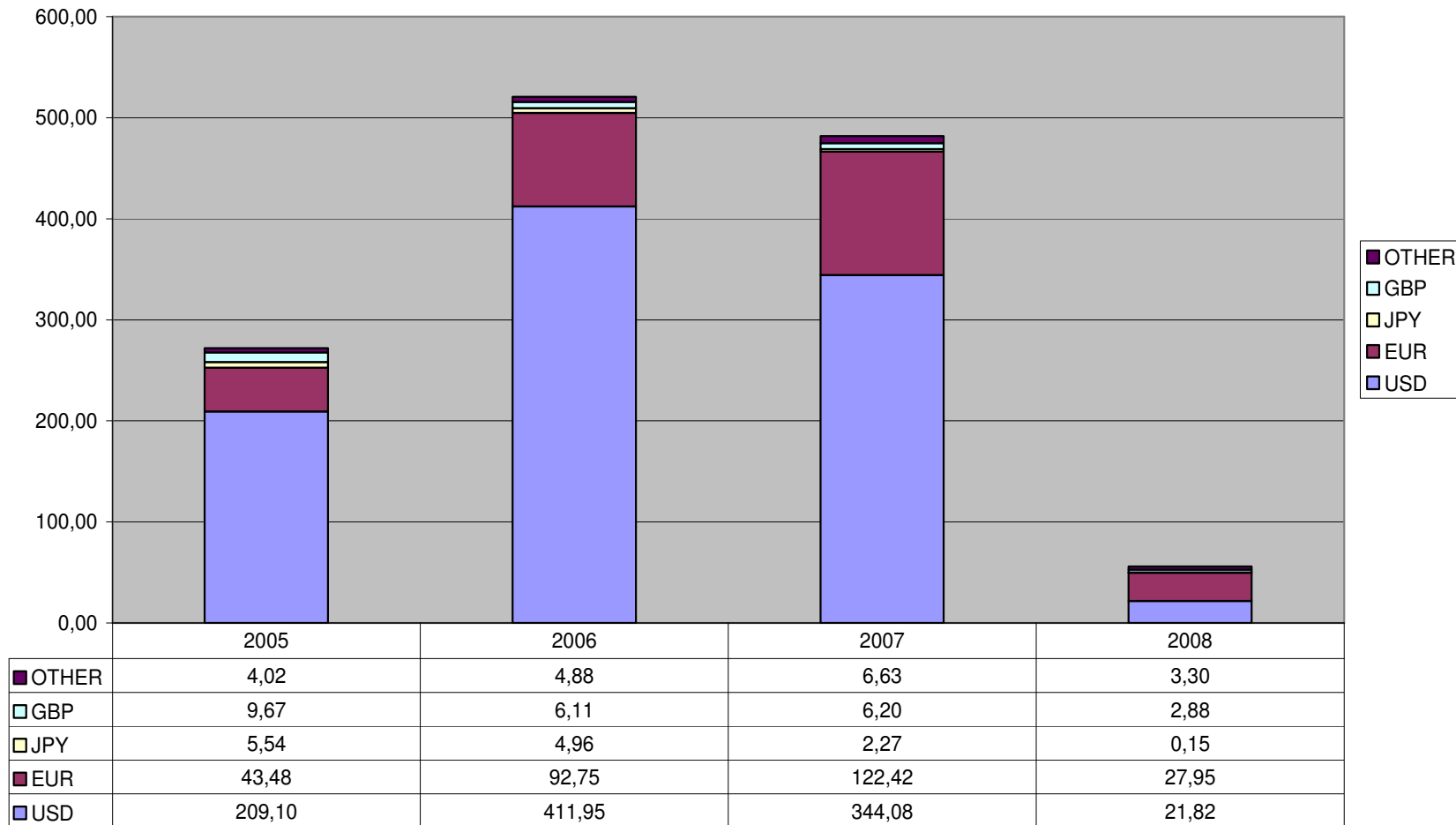
Exposure of various US Financial institutions to Subprime mortgages (Shin Hyun Song, 2009: "Securization undermined Financial Stability", available at www.voxeu.org) in the middle of 2008

	Total reported subprime Exposure (US\$bn)	Percent of reported exposure
Investment Banks	75	5%
Commercial Banks	418	31%
GSEs	112	8%
Hedge Funds	291	21%
Insurance Companies	319	23%
Finance Companies	95	7%
Mutual and Pension Funds	57	4%
Leveraged Sector	896	66%
Unleveraged Sector	472	34%
Total	1.368	100%

This mean that quite a lot of subprime exposure remained on the books of banks and other highly leveraged institutions. The biggest share was in the form of CDOs ('Collateralized Debt Obligations'). Due to its specific structure (several tranches, banks usually purchased the most senior tranche) these securities were supposed almost risk free. However, this was not true, partly due to valuation errors. This was quite accurately documentet in recent article from Wired magazine (Felix Salmon, 2009, [Recipe for Disaster: The Formula that Killed Wall Street](http://www.wired.com), www.wired.com)

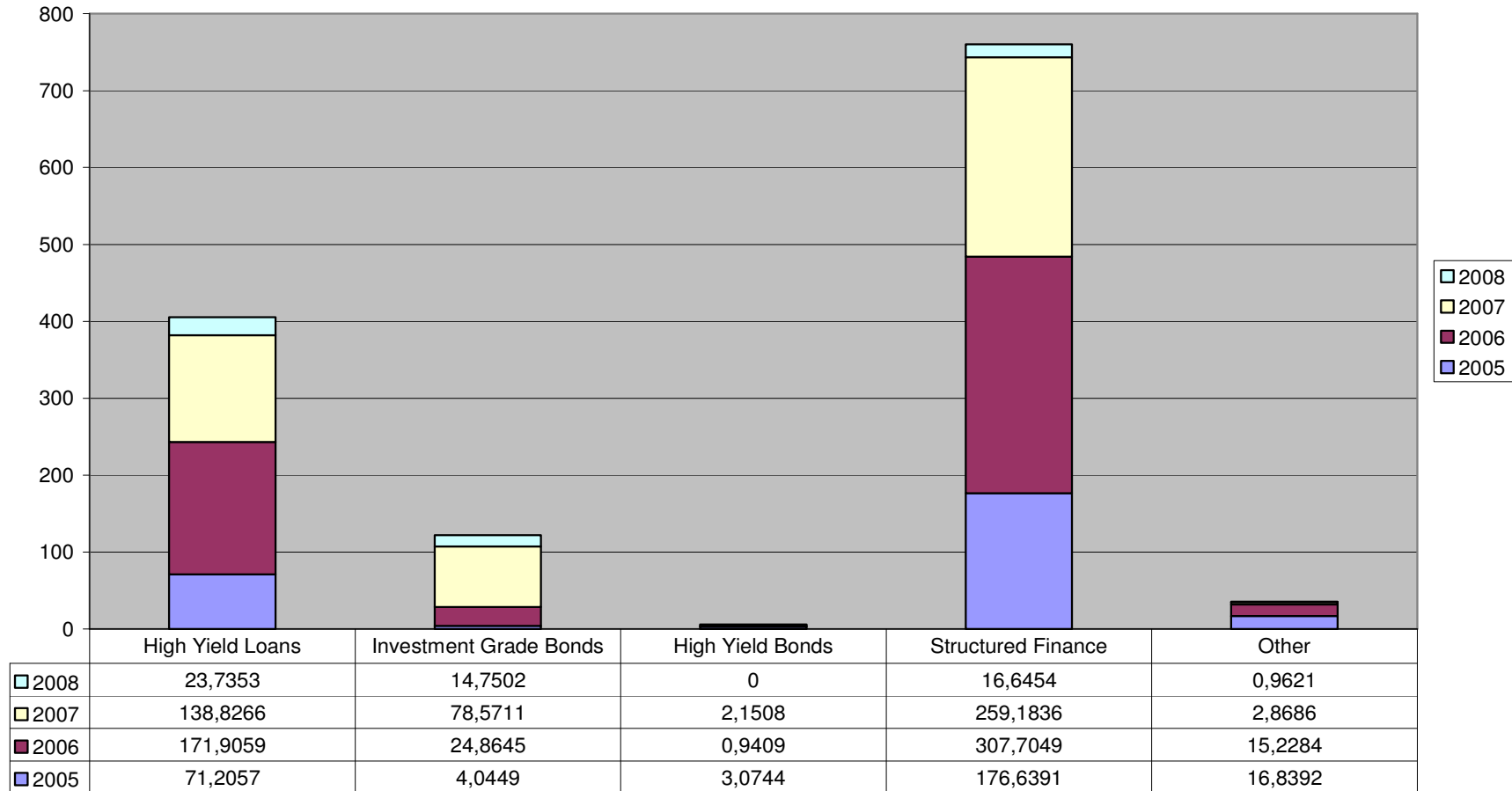
***The consequence of subprime mortgages securitization:
Rise and Fall of CDO Issuance Business (Source: www.sifma.org)***

Global CDO Issuance by Currency (bn USD)



A similar picture – presentation by collateral (Source: www.sifma.org)

Global CDO Issuance by Collateral (bn USD)



***The role of Fed monetary policy in the crisis –
were federal funds rates too low?***

The answer is probably affirmative. We can compare actual federal funds rates with model prediction.

***Model which can be used is TAYLOR RULE
(after John Taylor, renowned US economist)***

Exhibit 1: Comparison of actual and model (Taylor rule) values in years 2001-2006 (Chart from The Economist)

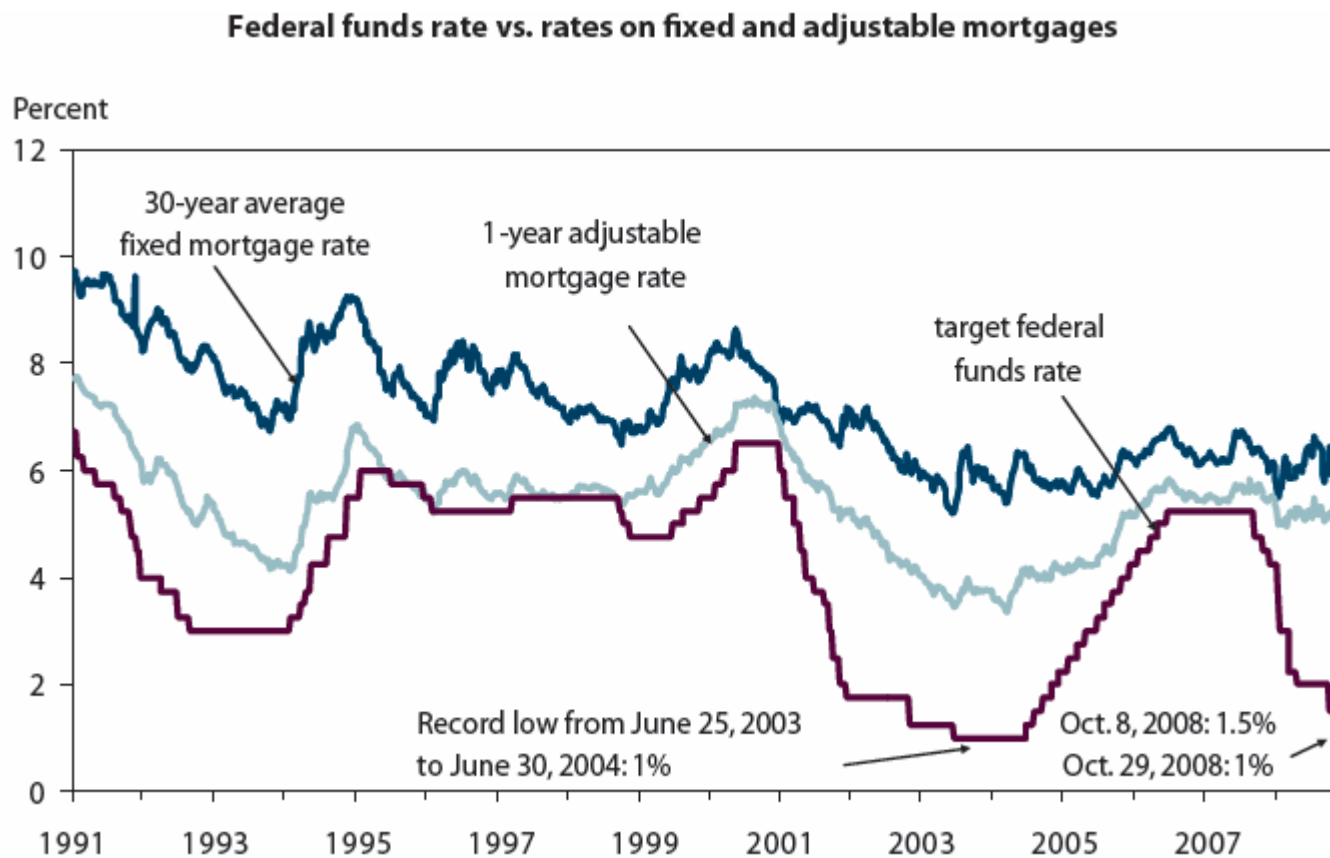
Exhibit 2: Comparison of federal funds rates with rates on fixed and adjustable mortgages (Barth et al, 2009 "Rise and Fall of the U.S. Mortgage and Credit Markets", www.milken.org).

Both Exhibit 1 and Exhibit 2 provide evidence for the thesis that federal funds rates were indeed too low

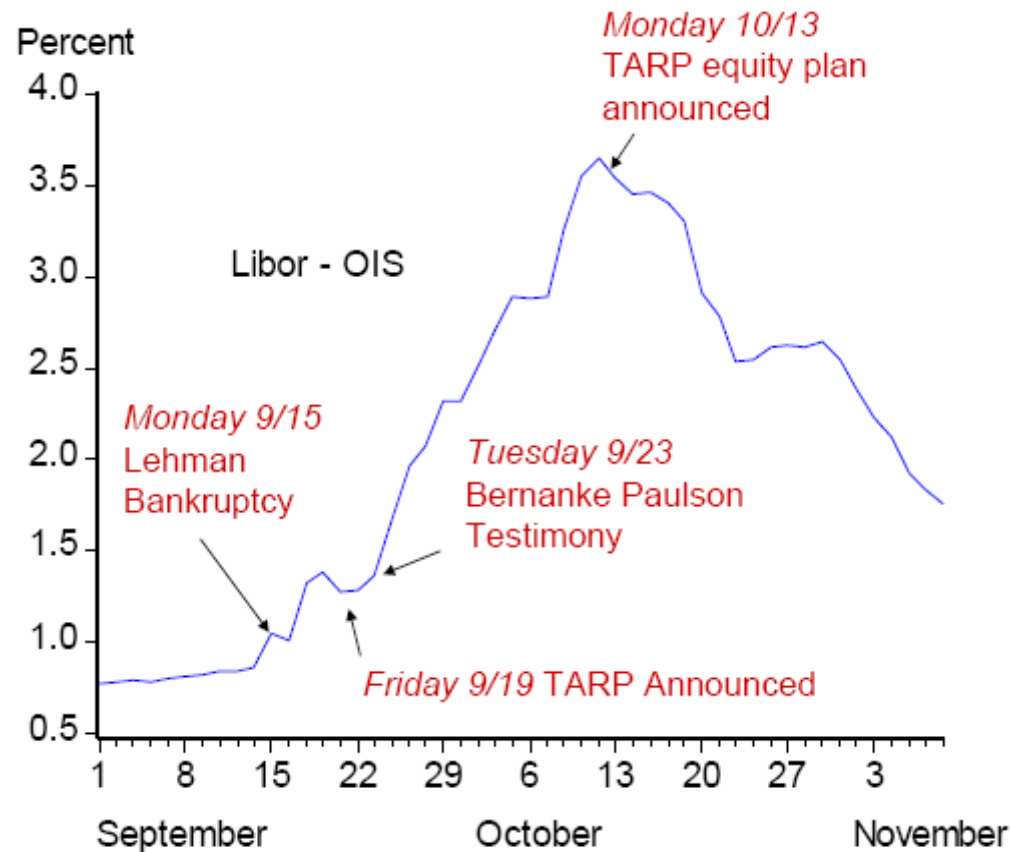
Exhibit 1: Chart from *The Economist*, October 18, 2007



Exhibit 2: Chart from *the "Rise and Fall of the U.S. Mortgage and Credit Markets", 2009, Milken Institute)*



***Another Taylor's finding:
Event Study of the Dramatic Worsening of the Crisis (Taylor,2008):***



***OIS = Overnight Indexed Swap; Libor – OIS = measure of risk and liquidity
Worsening of the crisis began more than week after Lehmann bankruptcy.
Taylor's conclusion: worsening was more due to fact that government
and Fed did not have any viable plan than due to Lehman Bankruptcy***

ON THE ROLE OF RISK MANAGEMENT IN THE CRISIS

Risk management procedures in the bank are generally structured in a following way:

1. Risk measurement, estimation and monitoring (quantitative and qualitative methods, data analysis etc.)

2. Setting risk preferences ('risk appetite' according to Basel II Pillar 2)

3. Prices (or cost) of risk realized in the market at the transaction level

At the point 1 problems arise due to information asymmetry or inaccurate quantitative methodologies (e.g. formulae for CDO tranche valuation)

At the point 3 problems are mainly due to competitive forces, which can reduce the cost of risk, comparing with measurement at point 1.

Accepting lower price of risk than attained by risk measurement is equal to increasing risk appetite

Responsibility for such decisions are primarily with top management

It is desirable to avoid scenarios similar to those from the following cartoon (*International Herald Tribune*, December 2008):

