



# Financial Crisis

## Origins and Consequences on Financial Institutions Focusing on Insurance Companies (Session 1)

*Solvay Business School – VUB*

*Fabian Suarez – April 2009*

[www.actuarisk.be](http://www.actuarisk.be)



# Agenda

1. Macroeconomic View: The US Economy
2. US Mortgages and Credit Derivatives Products
3. Impact of the Crisis on Financial Institutions
4. Conclusion



1. Macroeconomic View:  
The US Economy

Macroeconomic View

# The National Income Accounts Identity

- GDP's goal is to summarise in a single number the value of economic activity in a period of time:

$$Y = C^d + I^d + G^d + EX$$

Economy's output (GDP)     
 Domestic spending on domestic goods and services     
 Foreign spending on domestic goods and services

$C^d$ : consumption of domestic goods and services  
 $I^d$ : investment in domestic goods and services  
 $G^d$ : government purchase of domestic goods and services  
 $EX$ : exports of domestic goods and services

- In terms of total consumption, total investment and total government purchases, this identity becomes:

$$Y = C + I + G + NX$$

- $NX$  is the net exports (exports – imports) which is also called the trade balance.

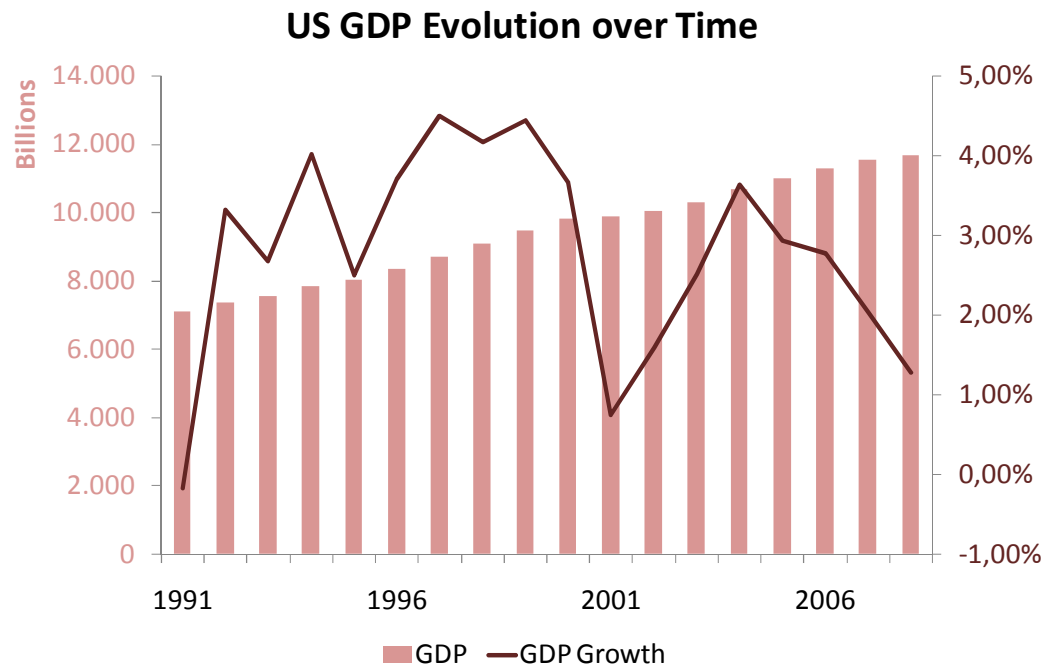


$$\underbrace{(Y - C - G)}_{\text{National saving}} - I = NX$$

Macroeconomic View

# US GDP

- Was the US economy performing well?



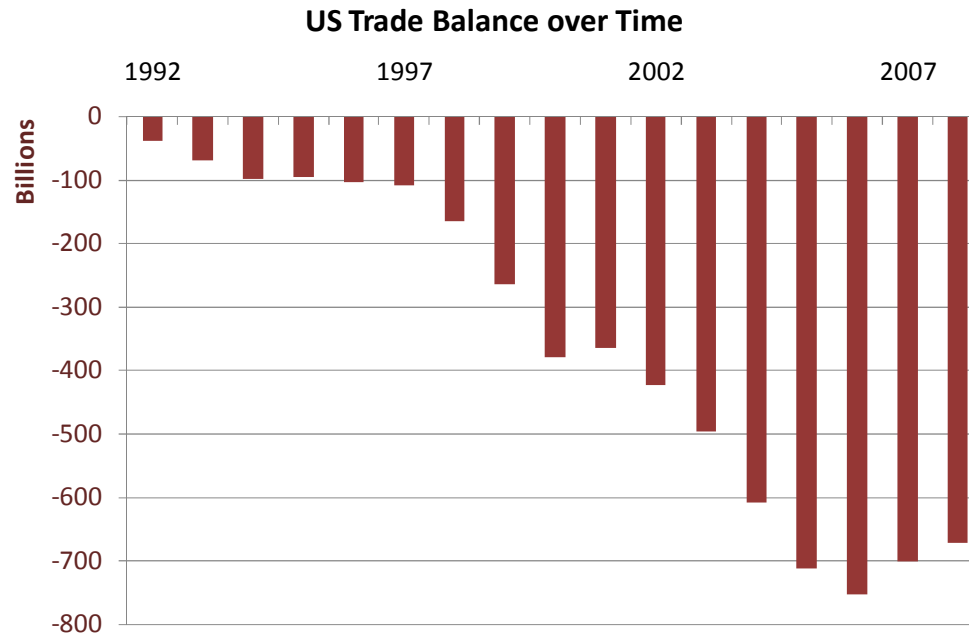
Source: US Department of Commerce – GDP in chained (2000) dollars

- On most dimensions the US economy appears to be performing well. Output growth has returned to healthy levels, the labour market is firming, and inflation appears to be well controlled. But...

Macroeconomic View

# US Trade Balance

- US trade balance\* in dollars:



Source: US Department of Commerce

- US investment exceeds US saving. Corresponding to that deficit, US citizens, businesses, and governments on net had to raise billions on international capital markets.

\* For the sake of simplicity, we ignore the differences between the trade balance and the current account!

# Consequences of US Trade Deficit

In 2005, Ben Bernanke concluded a lecture as follows:

- Because investment by businesses in equipment and structures has been relatively low in recent years and because the tax and financial systems in the US are designed to promote homeownership, much of the capital inflow has shown up in higher rates of home construction and higher home prices.
- Higher home prices in turn have encouraged households to increase their consumption.
- The greater the extent to which capital inflows act to augment residential construction and especially current consumption spending, the greater the future economic burden of repaying the foreign debt is likely to be.



## 2. US Mortgages and Credit Derivative Products



# The US Mortgage Industry

- Within the US mortgage industry, different mortgage products are generally defined by how they differ from the types of "conforming" or "agency" mortgages, ones guaranteed by the Government-Sponsored Enterprises (GSEs) Fannie Mae and Freddie Mac:

*Subprime loans can offer an opportunity for borrowers with a less-than-ideal credit record to become a home owner.*

**Subprime**

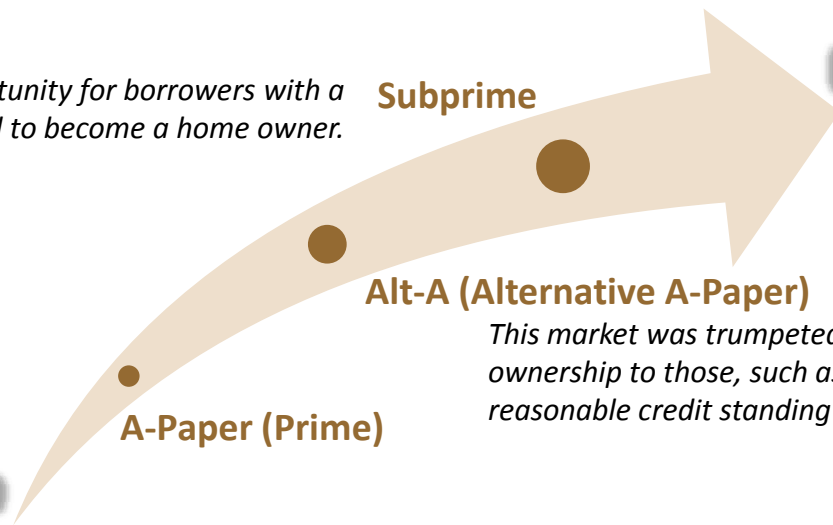
**High Risk Profile**

**Alt-A (Alternative A-Paper)**

*This market was trumpeted as a means of extending home ownership to those, such as the self-employed, with a reasonable credit standing but unsteady income.*

**A-Paper (Prime)**



**Low Risk Profile**



Macroeconomic View

US Mortgage Industry

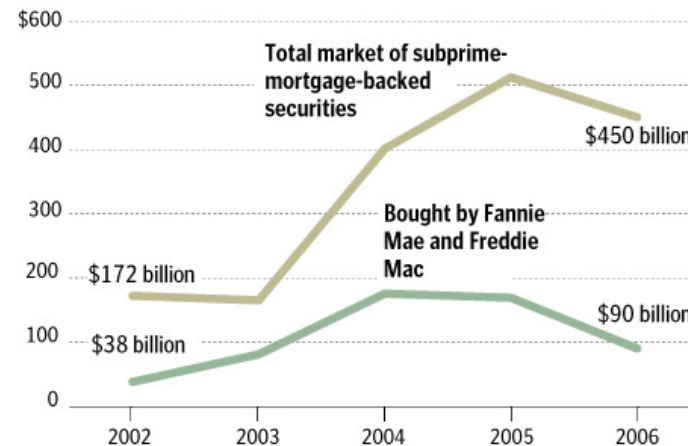
# GSEs' Lending Policy

-   GSEs extend credits to prime borrowers, therefore, they should not be affected by the subprime crisis.  
But ... ([Video source: www.economist.com](http://www.economist.com))

- US administrations (since the Clinton one) have changed the rules of the game...

Instruments generated by SECURITISATION

Subprime-mortgage-backed securities  
By year purchased, in billions of dollars



22%    49%    44%    33%    20%

Subprime-mortgage-backed securities bought by Fannie Mae and Freddie Mac as a percentage of total subprime-mortgage-backed securities market

Source: The Washington Post, June 10<sup>th</sup> 2006

# What is Securitisation?

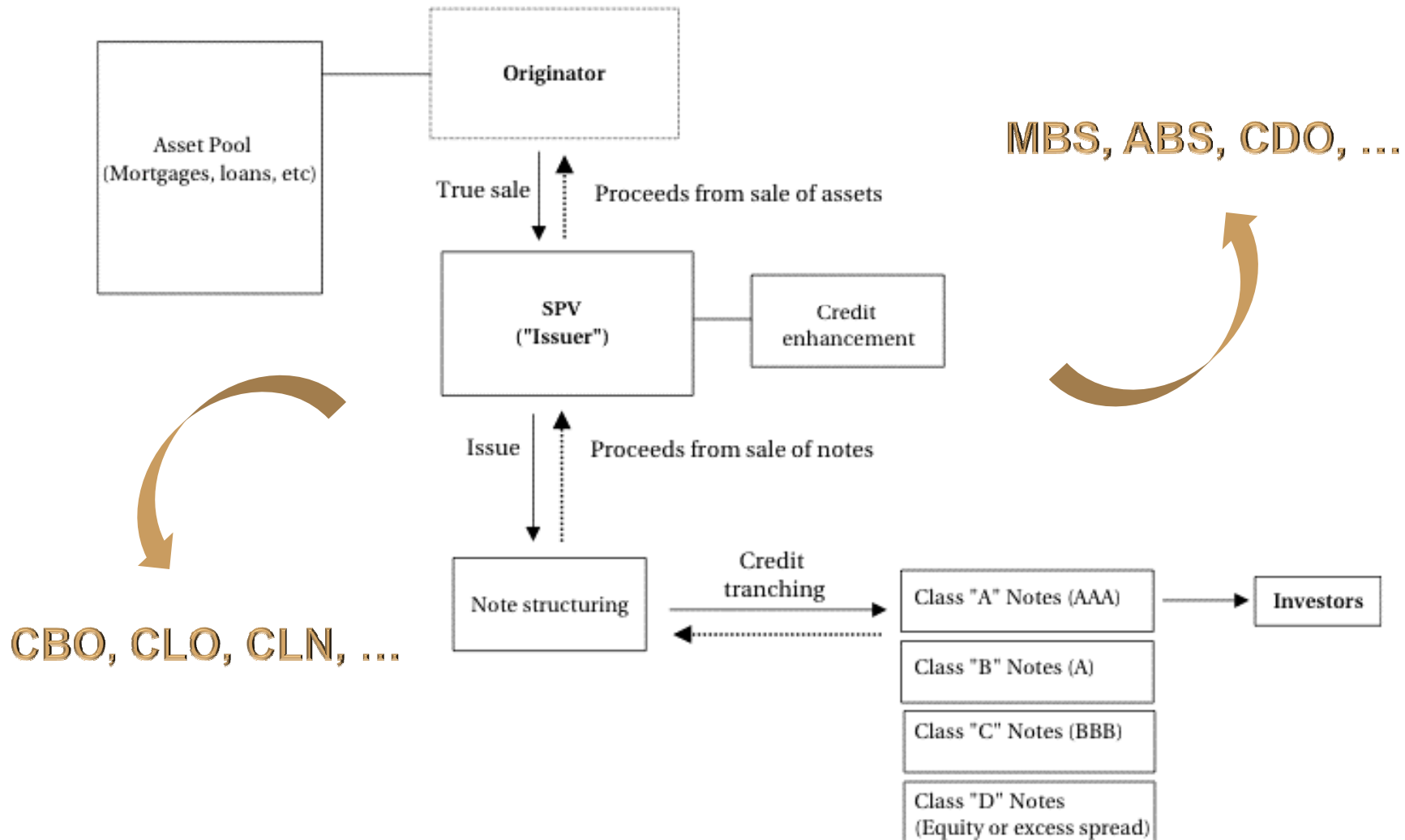
- Securitisation is a well-established practice in the global debt capital markets. It refers to the sale of assets, which generate cashflows, from the institution that owns them, to another company that has been specifically set up for the purpose, and the issuing of notes by this second company.
- These notes are backed by the cashflows from the original assets.
- Securitisation allows institutions such as banks and corporates to convert assets that are not readily marketable, such as residential mortgages or car loans, into rated securities that are tradeable in the secondary market.



Macroeconomic View

US Mortgage Industry

# Securitisation Process



# Benefits of Securitisation

- The main reasons that a bank will securitise part of its balance sheet is for one or all of the following reasons:
  - funding the assets it owns;
  - balance sheet capital management;
  - risk management and credit risk transfer.
- Investor interest in the ABS market has been considerable from the market's inception. This is because investors perceive asset-backed securities as possessing a number of benefits. Investors can:
  - diversify sectors of interest;
  - access different (and sometimes superior) risk-reward profiles;
  - access sectors that are otherwise not open to them.

# Dangers of Securitisation

Two charges are levelled against the technique:

- The first is that it fails to disperse risk effectively; in bad times, the risks flow back to the banks as toxic assets in their balance-sheets:
  - In 2008, Citigroup and HSBC between them consolidated assets worth \$94 Bio that had been sitting in structured investment vehicles (SIVs).
  - Some argue that the events of the past few months, far from exposing securitisation as a failure, showed that it did not go far enough. If loans had really been sold off to investors, banks would not have been sucked so deeply into the mess.
- The second charge is that securitisation degrades credit quality by weakening lenders' incentives to monitor the quality of the loans they write.

 **What is behind the subprime crisis?**

Macroeconomic View

US Mortgage Industry

# The Subprime Primer (1/7)

The Subprime Primer: a simple and humorous guide to understand the subprime mess...

Source: <http://www.farmandcountryfinance.co.uk/sub-primemortgages.pdf>

At the Mortgage Broker's .....

(1)

Ace Mortgage Brokers

"We Make Your Dreams Come True"



(2)

Ace Mortgage Brokers

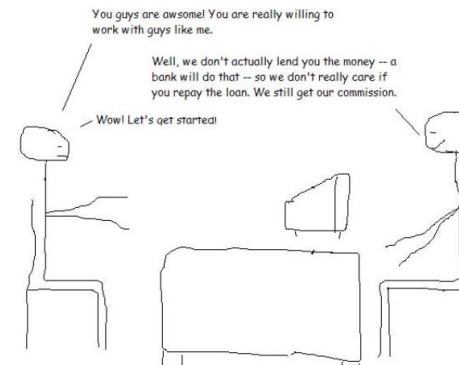
"We Make Your Dreams Come True"



(3)

Ace Mortgage Brokers

"We Make Your Dreams Come True"



# The Subprime Primer (2/7)

A Few Weeks Later, at the Bank .....

(4)

First Bank of Bankland, Inc

"Open Your Christmas Club Account Today"



I'd better get rid of these crappy mortgage loans. They are starting to stink up my office. Thankfully the really smart guys in New York will buy them and perform their financial magic! I'll call them right away!

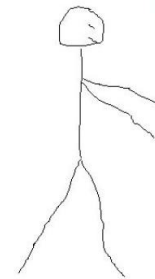
NEW MORTGAGE FILE



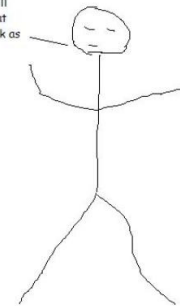
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RSG Investment Bank of Wall Street

"Trust the 'Really Smart Guys' for All Your Investment Needs"



I've got it! First We'll create a new security and use these crappy mortgages as collateral. We'll call it a CDO (or maybe CMO). We can sell that CDO to investors and promise to pay them back as the mortgages are paid off.



Let's See What the Smart Guys Are Doing...

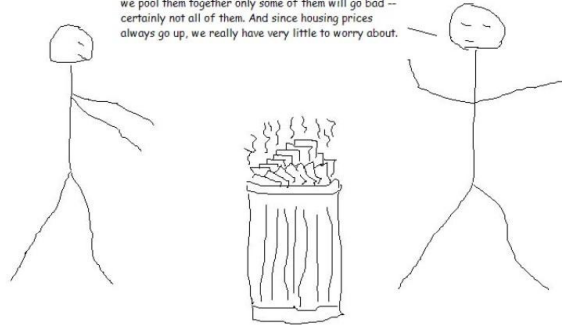


# The Subprime Primer (3/7)

(6) RSG Investment Bank of Wall Street

"Trust the 'Really Smart Guys' for All Your Investment Needs"

Sure, individually these are pretty crappy loans, but if we pool them together only some of them will go bad -- certainly not all of them. And since housing prices always go up, we really have very little to worry about.



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"Trust the 'Really Smart Guys' for All Your Investment Needs"

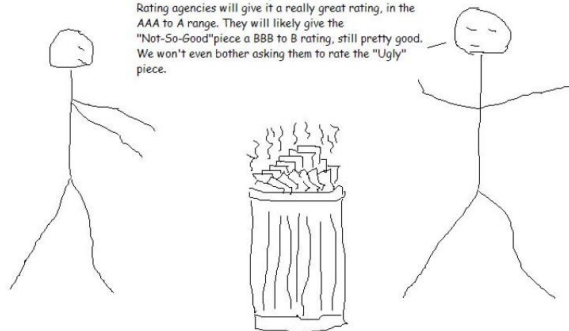
The new CDO will work like this: It will be made up of three pieces (or "tranches") and we'll call them "The Good", "The Not-So-Good" and "The Ugly".



(8) RSG Investment Bank of Wall Street

"Trust the 'Really Smart Guys' for All Your Investment Needs"

Exactly. But wait, it gets better. We will buy bond insurance for the "Good" piece. If we do that, the Rating agencies will give it a really great rating, in the AAA to A range. They will likely give the "Not-So-Good" piece a BBB to B rating, still pretty good. We won't even bother asking them to rate the "Ugly" piece.



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"Trust the 'Really Smart Guys' for All Your Investment Needs"

The assholes at the SEC won't let us sell this stuff to widows and orphans, so we'll sell it to our sophisticated institutional clients.



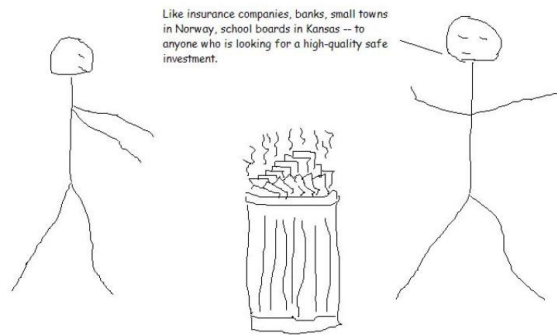
Macroeconomic View

US Mortgage Industry

# The Subprime Primer (4/7)

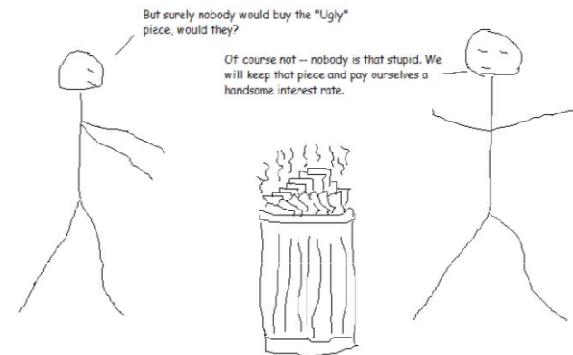
## (10) RSG Investment Bank of Wall Street

"Trust the 'Really Smart Guys' for All Your Investment Needs"



## (11) RSG Investment Bank of Wall Street

"Trust the 'Really Smart Guys' for All Your Investment Needs"



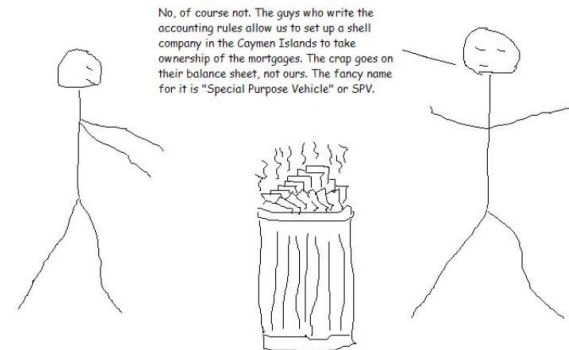
## (12) RSG Investment Bank of Wall Street

"Trust the 'Really Smart Guys' for All Your Investment Needs"



## (13) RSG Investment Bank of Wall Street

"Trust the 'Really Smart Guys' for All Your Investment Needs"



Macroeconomic View

US Mortgage Industry

# The Subprime Primer (5/7)

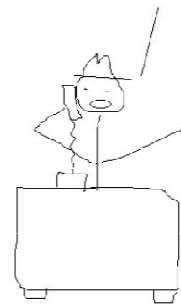
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*Gee, We Never Saw it Coming.....*

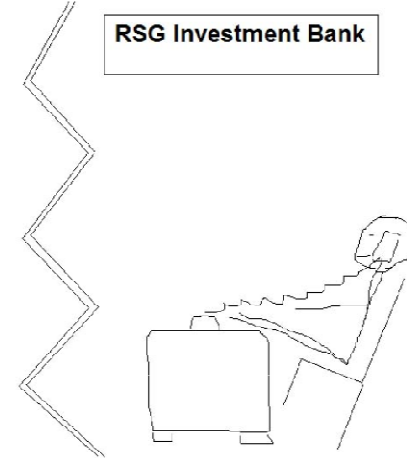
(15)

**Norwegian Village Pension Fund**

Hey man, what the hell is up?  
We're not receiving our  
monthly payment!



**RSG Investment Bank**



(16)

**Norwegian Village Pension Fund**



**RSG Investment Bank**

Yeah, I meant to call you but it's been really  
crazy around here. It seems that the assholes who  
took out the mortgages backing your CDO aren't  
able to pay them off.



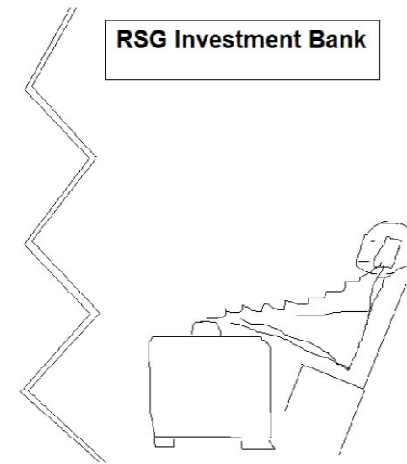
(17)

**Norwegian Village Pension Fund**

Wait a minute! We bought the AAA  
"Good" piece of the CDO. You know?  
The safe one. We're supposed to be  
getting paid first.



**RSG Investment Bank**



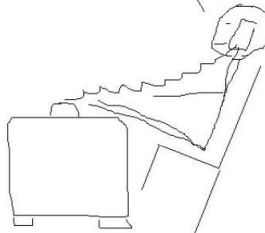
# The Subprime Primer (6/7)

(18) Norwegian Village Pension Fund



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Well unfortunately the loans were quite a bit crappier than we originally thought and there is very little cash coming in. Frankly, I assure you that we are as disappointed as you are.

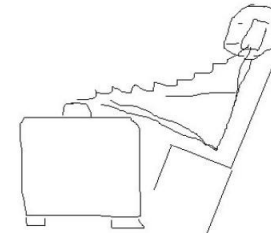


(19) Norwegian Village Pension Fund

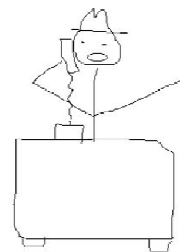


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But you told me that housing prices always go up and that your borrowers could always refinance their mortgages!

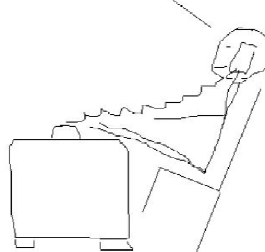


(20) Norwegian Village Pension Fund

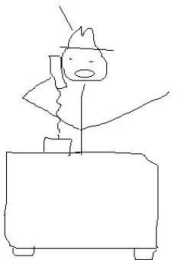


RSG Investment Bank

Yeah, that was a bad assumption. We fucked up. Sorry.

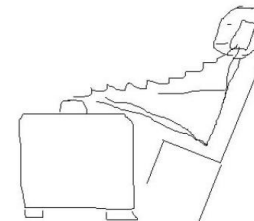


(21) Norwegian Village Pension Fund



RSG Investment Bank

Bad assumption my frigid Norwegian ass! What about the AAA rating from the agencies?

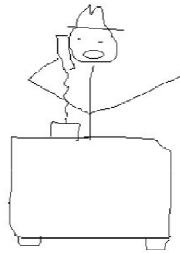


Macroeconomic View

US Mortgage Industry

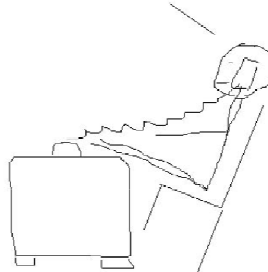
# The Subprime Primer (7/7)

(22) Norwegian Village Pension Fund



RSG Investment Bank

They fucked up too.



(23) Norwegian Village Pension Fund

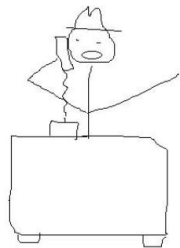


But this security was insured! What about the insurers?

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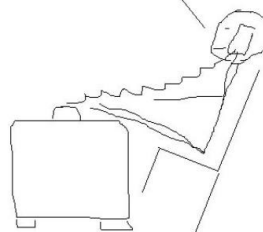


(24) Norwegian Village Pension Fund



RSG Investment Bank

Are you kidding? There's no way they have enough money set aside to cover this mess. They fucked up.



(25)

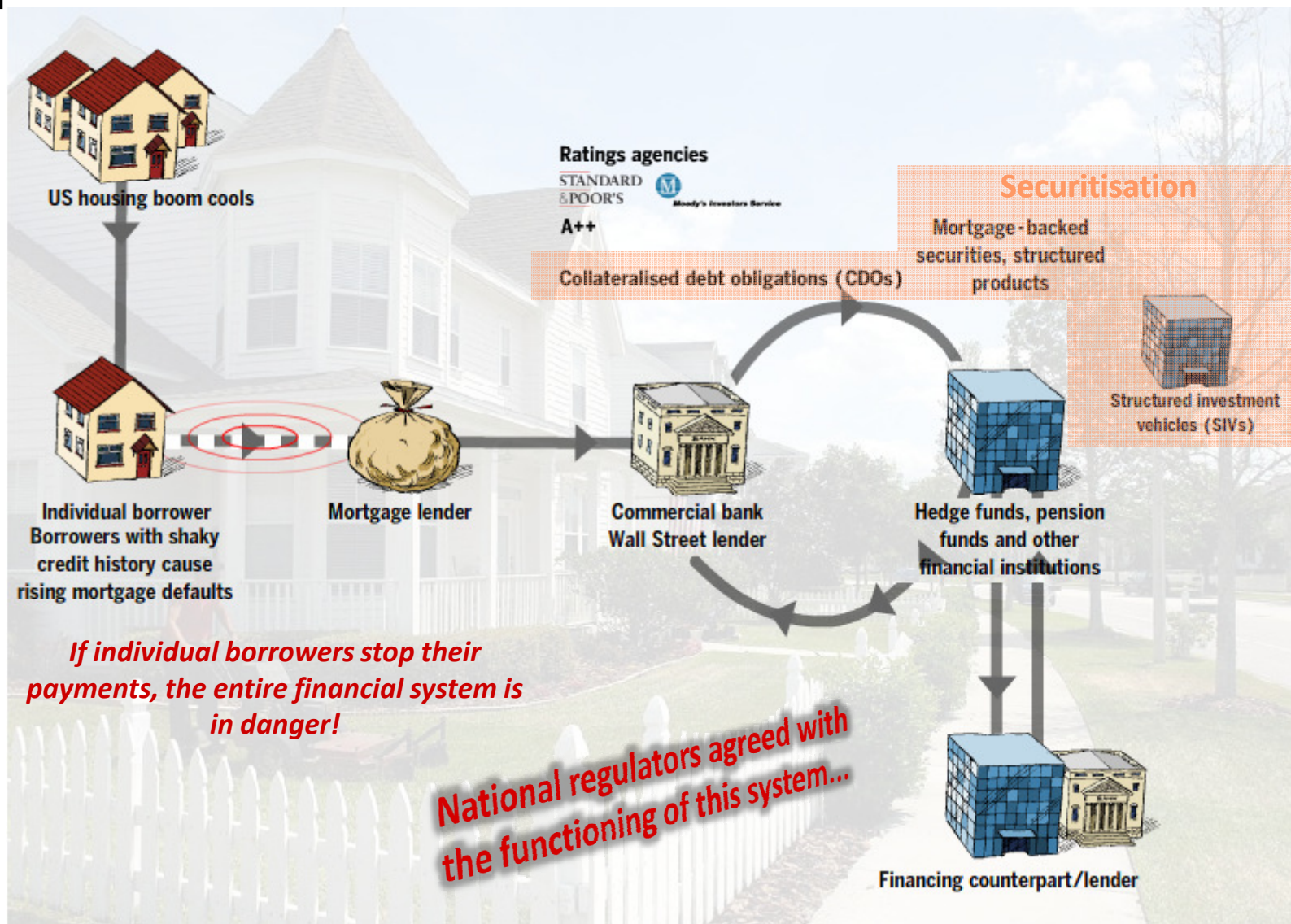
The End



Explanation of the FT about the credit squeeze

[Video source: media.ft.com](http://media.ft.com)

# Contagious Effect of the Subprime Model



### 3. Impact of the Crisis on Financial Institutions

Macroeconomic View

US Mortgage Industry

Impact of the Crisis

# 2008: Distrust Year for Banks

Solvency?

Liquidity?

Countrywide (VS)	Northern Rock (VK)	Sachsen LB (Dui)	Bear Stearns (VS)	Alliance & Leicester (VK)	Dresdner Bank (Dui)
lot					
Overgenomen	Genationaliseerd	Overgenomen	Overgenomen	Overgenomen	Overgenomen
balanstotaal in miljoen dollar, op 31/12/2007					
211.730	217.154	98.988	395.362	156.833	730.305
waardeverminderingen in miljard dollar					
-	-	-	3,2	1,1	4,5
vers kapitaal in miljard dollar					
-	-	-	0	0	0
jobverlies					
-	-	-	9.159	0	-
beurskoers van 1 januari tot midden december 2008					
-53% (tot 30 juni)	+6,8% (tot 15 februari)	-	-89% (tot 30 mei)	-69% (tot 10 oktober)	-

Fannie Mae (VS)	Freddie Mac (VS)	Lehman Brothers (VS)	Merrill Lynch (VS)	AIG (VS)
Gered door overheid	Gered door overheid	Failliet	Overgenomen	Gered door overheid
882.547	794.368	691.063	1.020.050	1.060.505
56	58,4	13,8	55,9	60,9
15,6	7	13,9	29,9	64,9
-	-	13.390	5.720	980
-98%	-98%	-99%	-76%	-97%

HBOS (VK)	Washington Mutual (VS)	Bradford & Bingley (VK)	Fortis (B/NL)	Royal Bank of Scotland (VK)	Kaupthing (IJs)
lot					
Overgenomen	Failliet	Overgenomen	Ontmanteld	Gered door overheid	Genationaliseerd
balanstotaal in miljoen dollar, op 31/12/2007					
1.324.819	327.913	103.260	1.271.921	3.775.180	85.193
waardeverminderingen in miljard dollar					
9,2	45,6	-	3,2	15,1	-
vers kapitaal in miljard dollar					
22,9	30,1	-	2	48,5	-
jobverlies					
615	4.200	-	-	10.200	-
beurskoers van 1 januari tot midden december 2008					
-88%	-99%	-93% (tot 26 september)	-95%	-82%	-23% (tot 3 oktober)

Landsbanki (IJs)	Glitnir (IJs)	Wachovia (VS)	Dexia (B/F)	UBS (Zwi)	Citigroup (VS)
Genationaliseerd	Genationaliseerd	Overgenomen	Gered door overheid	Gered door overheid	Gered door overheid
48.712	46.981	782.896	882.663	2.011.131	2.187.631
-	-	96,5	1,2	48,6	65,7
-	-	11	8	30,1	74
-	-	8.393	-	9.000	75.000
-41% (tot 3 oktober)	-82% (tot 3 oktober)	-86%	-81%	-65%	-74%



# Solvency vs. Liquidity

## Solvency

- Capital which protect a financial institution against economic insolvency.
- A business is considered to be economically insolvent if the market value of its liabilities exceeds the market value of assets (negative equity).

## Liquidity

- Liquidity for a bank means the ability to meet its financial obligations as they come due.
- Example: Analysis of the balance sheet of a financial institution



# Solvency of Banks

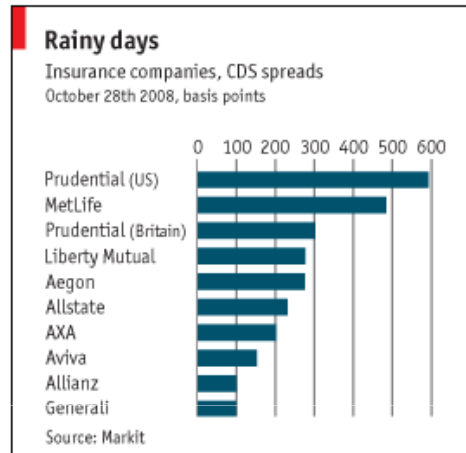
- Under Basel rules, Tier 1 is defined as:
  - The Committee considers that the key element of capital on which the main emphasis should be placed is equity capital and disclosed reserves.
  - Tier 1 capital ratio = Tier 1 capital / Risk-adjusted assets  $\geq$  6%



Source: *The Economist*, Feb 26<sup>th</sup> 2009

# Solvency of Insurers

Source: The Economist, Oct 30<sup>th</sup> 2008



- Insurers shares have sunk on worries that losses on their investments will leave them insolvent. Regulators and executives have tried to reassure investors, but been met with dark mutterings about insurers' reluctance to mark assets fully to market and their habit of inflating their capital with hybrid debt rather than plain equity.

- Are insurers really the new banks?
  - Like lenders, insurers' assets include shares and securities that have tumbled in value. But on the other side of the balance-sheet the comparison becomes laboured. Unlike banks, which rely heavily on debt funding, insurers' main liabilities are the claims they will pay their customers – for life firms these stretch over many years. Whereas the depositors and lenders who provide funds to banks can jump ship overnight, insurance customers find it hard and expensive to wriggle out of their contracts.

Macroeconomic View

US Mortgage Industry

Impact of the Crisis

# Turmoil in the Insurance Industry

- By December 31<sup>st</sup> 2008, only AIG needed a bailout.
- Since beginning 2009:



*Swiss Re on Thursday turned to Warren Buffett, the legendary US investor, for SFr3bn (\$2.6bn) in fresh funding and cut its dividend to virtually nothing as it struggled to retain its investment-grade credit rating.*


Source: Financial Times, Feb 5<sup>th</sup> 2009

**Will other insurers follow the path of these two big giants?**



*Axa managed only partly to address concerns about the adequacy of its capital base in its annual results presentation last week, saying, disarmingly, that it might raise €2bn of preference shares as an “insurance policy”. It also cut its dividend by two-thirds for 2008, signalling that cash was tight. That was only prudent after €2.8bn of mostly equity-related writedowns triggered an 83 percent plunge in full year net profit.*

Source: Financial Times, Feb 24<sup>th</sup> 2009



## 4. Conclusion

Macroeconomic View

US Mortgage  
Industry

Impact of the  
Crisis

Conclusion

# Conclusion

John Reed, a journalist, wrote in the Financial Times:

*It is relatively easy to list behaviour that contributed to the financial “mess”: greed, misaligned incentives, analytic failures, a tolerance for customer abuse and so forth. It is also easy to list the players: bankers, investors, rating agencies, accountants, regulators, boards, etc. I would also say the responsibility for all of this rests with “the industry”, not externalities such as deregulation (there was not any that was relevant) or easy money (a banking system surely should be able to function over normal cycles) or the government.*