The Financial Crisis of 2007-2009 in a Historical Context

by Niso Abuaf, Ph.D.

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More Complex Causes of the Current Crisis and Forward Looking Regulatory Principles

- Reasons version 2.0
  - The principal-agent problem
  - Moral hazard
  - Too big to fail
  - Adverse (positive) feedback loops
  - Knight’s risk vs. uncertainty
    - Black swans and fat tails
    - Known knowns
    - Known unknowns
    - Unknown unknowns
  - Pascal’s wager: no atheists in foxholes
  - Buying tail insurance
  - Godhart’s law: targeted human behavior changes
  - Regime shift (the Lucas critique)
  - Gapping

Manias Panics and Crashes in a Historical Context

- Financial Crisis: A Hardy Perennial
  - The more it changes the more it is the same thing
  - Plus ça change, plus c’est la meme chose
- In biblical texts
  - In the Old Testament
  - In the Koran
  - Pharaoh’s dream and Joseph’s response
  - The seven year feast and famine cycle

Pharaoh's Dream, circa 1600 B.C.

- "…and seven cows fat and sleek, came up out of the Nile and fed in the reed grass; and seven other cows came up after them, poor and very gaunt and thin, such as I had never seen in all the land of Egypt. And the thin and gaunt cows ate up the first seven fat cows, but when they had eaten them no one would have known that they had eaten them, for they were still as gaunt as at the beginning."
- "I also saw in my dream seven ears growing on one stalk, full and good; and seven ears, withered, thin, and blighted by the east wind, sprouted after them, and the thin ears swallowed up the seven good ears."

Joseph's Response

- "There will come seven years of great plenty throughout all the land of Egypt, but after them there will arise seven years of famine, and all the plenty will be forgotten in the land of Egypt; the famine will consume the land, and the plenty will be unknown in the land by reason of that famine which will follow, for it will be very grievous."
- "And let them gather all the food of these years that are coming, and lay up grain under the authority of Pharaoh for food in the cities, and let them keep it. That food shall be a reserve for the land against the seven years of famine which are to befall the land of Egypt, so that the land may not parish through the famine."
- "Then there will come a year of abundant rain, in which the people will press the grape."

The Big Ten Financial Bubbles from the 17th Century to the 21st

The Dutch Tulip Bubble, 1636

- Related to boom in war against Spain
  - Speculation in
    - Shares of Dutch East India Company
    - Real estate
    - Exotic tulip bulbs
    - Common tulip bulbs
    - Canals
- No bank credit so down payments
  - One single Viceroy (rare) bulb (Fl. 2500); down payment
    - Two lasts (a measure) of wheat
    - Four lasts of rye
    - Eight pigs
    - A dozen sheep
    - Two oxheads of wine
    - Four tons of butter
    - A thousand pounds of cheese
    - A bed
    - Some clothing
    - A silver beaker

The South Sea Bubble, 1720

- Related to treaty of Utrecht, 1713
- Speculation in
  - South Sea Company stock
  - Government debt
    - Isaac Newton, Master of the Mint, co-inventor of calculus
      - “I can calculate the motions of heavenly bodies, but not he madness of people”
      - On 20 April sold his shares in the South Sea Company at 100% profit of £7000
      - Later bought a larger number of shares near the market top and lost £20,000
- Monetary expansion from
  - Sword Blade Bank
- Lender of last resort: Bank of England (?)

The Mississippi Bubble, 1720

- Related to death of Louis XIV, 1715
- Speculation in
  - Mississippi Company
  - Banque Générale, Banque Royale
- Monetary expansion from
  - John Law Banks
- No lender of last resort

The US Stock Price Bubble, 1927-29

- Related to
  - Extended postwar boom
  - Railroads
- Speculation in
  - Land to 1925
  - Stocks 1928-29
- Monetary expansion from
  - Stocks bought on margin
- Speculative peak: Sep 1929
- Crash: Oct 1929
- Car production declined to 93K in Dec ‘09 from 660K in Mar ‘09 (86%)
- Vs. from 15M to 10M today (33%)
- Milton Friedman and Anna Schwartz’s
  - Significant contraction of the US money supply
  - A Monetary History of the United States
  - The Education of Ben Bernanke
- Lender of last resort
  - FRBNY open-market operations (inadequate)

Latin American Bank Debt, 1979-82

- Related to
  - Third World syndicated bank loans
  - OPEC 1979 price rise in oil
  - Real estate in southwest US
  - US farmland
  - Dollar
- Monetary Expansion
  - Recycling of petrodollars to Latin America and other emerging countries
- Lender of last resort
  - IMF
  - FRBNY
  - US Gov't
  - Farm Loan Bank Board
- Innovation
  - Brady Bonds
    - Creates a trading market for bank debt
    - The major money center banks, the Latin American governments, and the US government all chip in

The Omnipotent Japan, 1990s

- The first of four in a 15-year cycle
- Related to
  - The omnipotent Japanese industrial conglomerates
  - Nikkei shares index
  - Real estate
- Monetary expansion from
  - Interest-rate reduction 1986
  - The cost of capital in Japan vs. the United States – a tale of two markets
- Lender of last resort
  - Ministry of Finance and Bank of Japan slow to react

The Bubble in Finland, Norway and Sweden, 1985-89

- The second of four
  - All are systematically related
- Related to
  - Real estate and stocks in Scandinavia
- Monetary expansion
  - Surge in the loans of the offshore branches of Tokyo and Osaka banks, as a result of relaxation of Japanese regulation
  - Nordic authorities relax foreign borrowing restrictions
- Lender of last resort
  - The regulators
  - The Wallenbergs
    - A model of private risk taking
    - Comparisons to the current crisis

The East Asian Tigers (paper?): Thailand, Malaysia, Indonesia and Korea, 1992-97

- The third of four
  - Rapid economic growth was both the result and the cause of the flow of inflow of foreign capital, especially from Japan
- The East Asian Miracle in the arc from Thailand to South Korea
  - Increases in GDPs comparable to the gains that Japan had made in the 1950s and 1960s
  - In Thailand, Malaysia and Indonesia in the first half of the 1990s stock prices increased by between 300 and 500%, and manufacturing activity surged.
  - Real estate prices soared
- In the winter of 1996, consumer finance companies in Thailand begin to suffer large losses
- In early July 1997 the Thai Baht depreciated sharply
- The depreciation of the Thai Baht triggered the contagion effect and within six months the foreign exchange values of each of the currencies on the Asian arc, with the exception of the Chinese Yuan and the Hong Kong dollar had lost more than 30% of their values
- Stock prices declined by 30 to 60% partly because foreign investors were seeking to cash out, partly because firms were no longer profitable
- Real estate prices declined sharply
- Most banks, with the exception of those in Singapore and Hong Kong, failed

The Salinas Miracle, 1994-95

- Related to
  - Deregulation
  - Capital inflow and outflow
  - Domestic boom
  - The privatization of Teléfonos de México
  - Telmex becomes the most highly traded stock in the NYSE
- Monetary expansion
  - Capital inflow
  - Bank lending
  - Domestic new banks,1991
  - Nationalized banks privatized, 1991
- The Tequila crisis, 1994-95
- Lender of last resort
  - US Stabilization Fund (Clinton, Rubin, Summers, Greenspan)
  - IMF
  - IADB

The Telecom, Media, Technology Bubble in the US, 1995-2000

- The fourth of the four
- Monetary expansion
  - Capital inflows from Asia following the bursting of the bubbles in Asia
  - Following the collapse of LTCM
  - Additional liquidity in anticipation of the Y2K transition
  - Every era has its prophets
- In a good year in the late 1990s, Henry Blodgett, Mary Meeker, and Jack Grubman respectively earned $10M, $15M, and $20M
- Henry got a lot of attention because in some internal emails within Merrill he was deriding the attractiveness of some of the stocks that he was promoting to the American public
- Jack Grubman of Salomon changed his recommendation on AT&T stock. The quid-pro-quo was that his kids would be admitted to the kindergarten at the 92nd Street Y.
- They all have left the business, some having paid big fines

The Chinese Miracle

- The US-Chinese current and capital account imbalances
- Chinese savings and the cost of capital in the World
- The US Alphabet Soup, 2003-2007
  - CDOs, CDO^2s
  - CLOs
  - Alt-As
  - CDSs (Credit Default Swaps)
  - CDXs, LTSAs, ABXs
- Prophets continued: Nouriel Roubini and Meredith Whitney

Anatomy of a Typical Crisis

- The Hyman Minsky Model
- Fueling the flames: the expansion of credit
- Adding more fuel to the flames: Freudian fantasies and technological inventions
  - Sexy tulip bulbs
  - Circumnavigation of the Earth
  - The ubiquitous and omnipresent internet
  - Financial engineering

The Hyman Minsky Model

- Hedge finance
  - Operating income more than sufficient to pay both interest and principal amortization
- Speculative finance
  - Operating income pays interest
  - New loans are needed to pay maturing debt
- Ponzi finance
  - Operating income not sufficient to pay interest
  - Firm increases debt, or sells assets
- As the economy slows, firms may move down in hierarchy

Ponzi Finance

- Carlos Ponzi
  - Operated a small loans company in the suburbs of Boston, 1920s
- Promised depositors 30% interest a month
- Transactions went smoothly for three months
- In the fourth month, the inflow of cash flows from depositors was smaller than the interest payments promised to older depositors
- Ponzi went to prison
- A generic term for non-sustainable pattern of finance

The Origins and Building Blocks of Financial Engineering

- In the early 1970s, Milton Friedman wanted to short the British Pound, he could not as he did not have credit lines
- Milton Friedman and Leo Melamed establish the Chicago International Money Market
- Fischer Black and Myron Scholes publish their seminal Option Pricing Paper in the Journal of Political Economy, 1976
- Wall Street is invaded by myopic quants, physicists who move from analyzing Black Holes to applying Black Scholes

Other Characteristics of Bubbles

- Euphorias
- Speculative manias
- Economic booms
- Rational vs. irrational exuberance
- This time it is different
- International contagion
  - From Tokyo to Bangkok to New York
  - From Beijing to New York to Europe
  - From New York to Latin America
  - From Korea to Argentina

Warning Signs

- Models of speculative markets
  - The random walk: from Bachelier to Fama
  - Momentum: the trend is your friend
  - Value models: from Graham Dodd to Warren Buffett; and Classical Purchasing Power Parity
- Sell the Japanese Imperial Palace, buy all of Australia
- Heroic assumptions in modeling cash flows: the question of the terminal value multiple

The Pricking of the Bubble: Panics and Crashes

- The Law of the Deterioration of Everything
  - Das Gesetz der Verschlechtigung aller Dinge
  - Or, when stuff hits the fan correlations go to one
- Financial distress
  - Remember the Minsky model
- How long does distress last
  - The role of the invisible hand
  - Positive vs. negative feedback rules
  - Government intervention

Frauds and swindles: chain letters, pyramid schemes, and Ponzi finance

- Mike Milken
- Enron
- World Com
- Two novelists’ punishment for Madoff:
  - “tie him into a sack with two wildcats and sink him in the Bosphorus” – adapted from Dreiser’s the Titan(1913) and Christina Stead’s House of all Nations (1938)

The Policy Response

- The Austrian and Chicago Schools
  - Ludwig von Mises
  - Friedrich Hayek
  - Milton Friedman
  - vs. John Maynard Keynes
- From benign neglect to moral suasion
  - What Hank Paulson and Ben Bernanke did to the CEOs of the largest US Banks

The Policy Response Continued

- The Greenspan put
- The uptick rule and the ban on short selling (positive, or adverse, versus negative feedback loops)
- Moral hazard
- Domestic and international lenders of last resort: the Bank of England, the Fed, the IMF (Bretton Woods), and the Chinese Central Bank, a new IMF?
- International policy coordination among central banks
- International coordination of accounting guidelines: rules vs. principles based accounting: The US vs. Europe
- Mark to model, mark to market, mark to myth accounting
- The new Fed in the current crisis
- The Powell doctrine

Overview of the Financial Crisis of 2007-2009

- The economic welfare benefits of financial innovation
- The seeds of the bubble
- Tracking the seeds of the bubble: the indicators
- The unraveling
- The short-term policy response
- More complex underlying causes and forward-looking regulatory principles

The Economic Welfare Benefits of Financial Innovations

- The great society where everyone can own a home
- Hedge funds which produced outsized returns for the common man
- Private equity funds that also produced outsized returns for Yale and Harvard, among others
- Everybody starts mimicking the investment philosophy of Yale’s David Swensen
- Remember the old rule that no behavioral rule in economics can remain permanent, sometimes known as the Lucas Critique
- The shadow banking sector comes of age

What is a Financial Crisis?

- Systemic risk
  - Widespread failures of financial institutions
  - Freezing up of capital markets
  - Reduction of supply of capital to the economy
  - Reduction of economic output
  - An adverse feedback loop from the real economy to the financial sector
- The financial sector is like the cardiovascular system
  - A financial crisis is like cardiac arrest
- A severe economic downturn does not necessarily imply a financial crisis

The Seeds of the Bubble

- Massive global liquidity
  - Petrodollars, foreign governments and sovereign wealth funds, financial institutions, global money supply expansion
  - The massive US-China current and capital account imbalances
  - The emergence of high-growth, high-saving “poor countries” vs. the slow-growth, high-consumption “rich countries”
  - Who is to blame: China or the US?
- Explosion of hedge fund activity
- Hyper-activity in M&A and LBO transactions
- Growth of the leveraged loan market
- Lax credit standards by both banks and the shadow banking sector
- Record low required yield spreads in a higher credit risk profile environment until June 2007
  - Increased spread volatility in H2 2007

The Seeds of the Bubble: The Transformation of the Credit Markets

- Rapid growth in derivatives and synthetics
- Rescue financing restructurings (privatization of bankruptcy)
- Distressed debt control investing (loan-to-own)
- Historically low default rates and high recoveries
- Extremely low equity and debt volatility until summer ’07
- The Alchemy of the credit rating agencies
  - There is always demand for “safe” securities because of institutional restrictions
  - Rating agencies squeezed as much “AAA” as possible out of products structure from pools of mortgages, and were paid handsomely
  - Typically mortgages would be bunched to form a pool tranched between: equity, BBB, A, AA, and AAA (e.g. 85% of pool)
  - The BBB would be re-tranched into new equity, and BBB - AAA (e.g. 65% of pool). These are difficult to value compound options.

The Seeds of the Bubble, continued

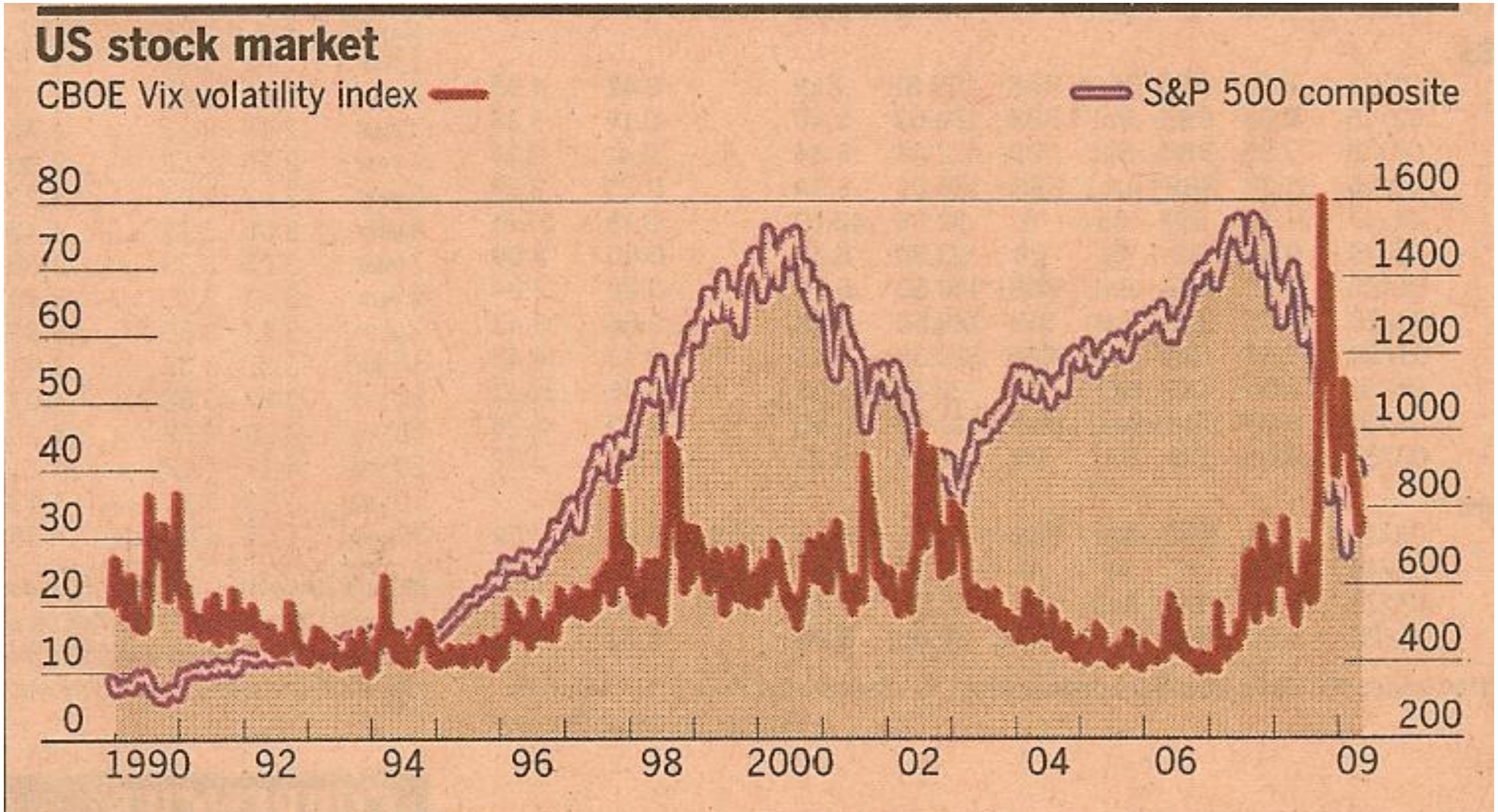
- The economy gorged itself on debt
  - Ratio of total debt/income in the US
    - 1972 (2:1) 1992 (3:1) 2007 (4.75:1)
- Stock and house prices boomed
- The securitization process
  - Increased debt
  - Introduced a principal agent problem
  - The rating agencies discovered a perpetual motion machine violating the principles of conservation of mass and energy
  - Investors relinquished their due diligence requirements (caveat emptor) and believed the rating agencies because they wanted to
- Higher level problems (to be discussed in more detail later)
  - Principal/agent
  - Moral hazard
  - Negative externalities

Tracking the Seeds of the Bubble: The Indicators

- House price to rent ratio
- Housing wealth/total household assets
- Household debt/home values
- Quality of new debt issuance
- Leverage ratio for LBOs
- Deteriorating credit quality of subprime mortgages
- Subprime mortgage AAA tranche pricing
- The US-China current and capital account imbalances
- The Fed’s balance sheet
- The performance of the equity markets
- Latter Day Prophets: Bill Gross and Mohamed El Erian of PIMCO

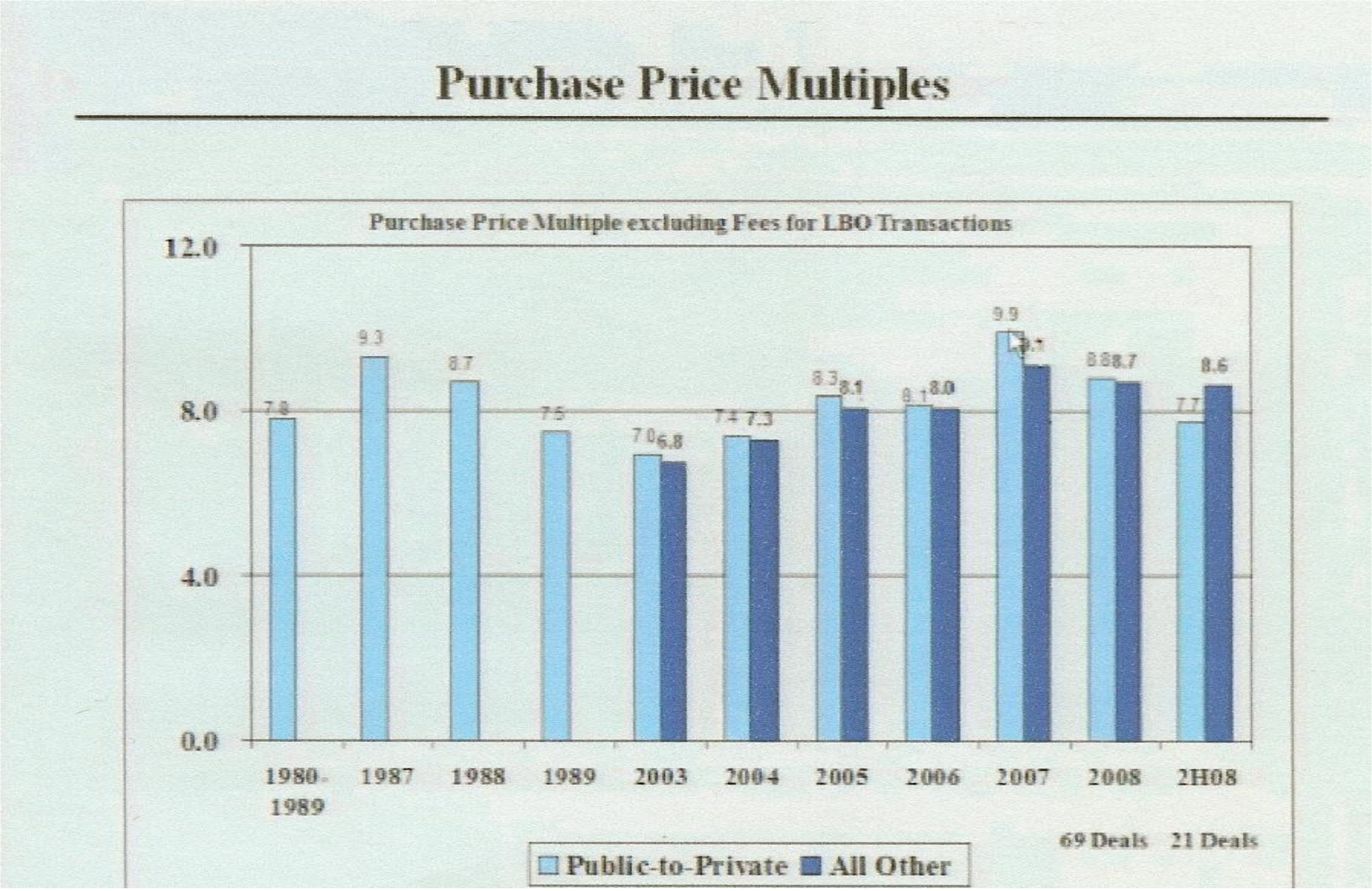
The Mother of all Imbalances: Global Current Accounts, US$ Billions

Macroeconomic Uncertainty and Volatility



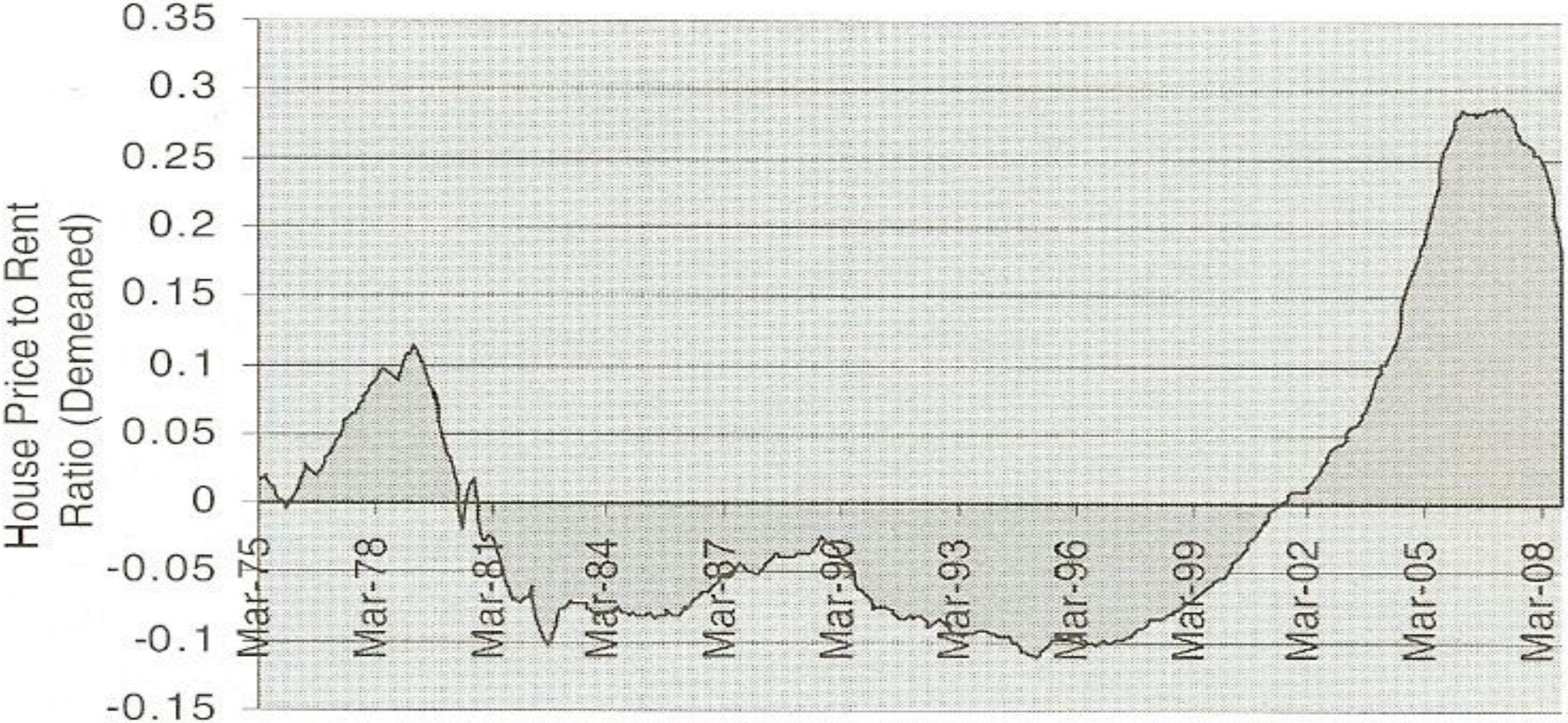
Source: Thomson Reuters Datastream and Financial Times

Purchase Price Multiple



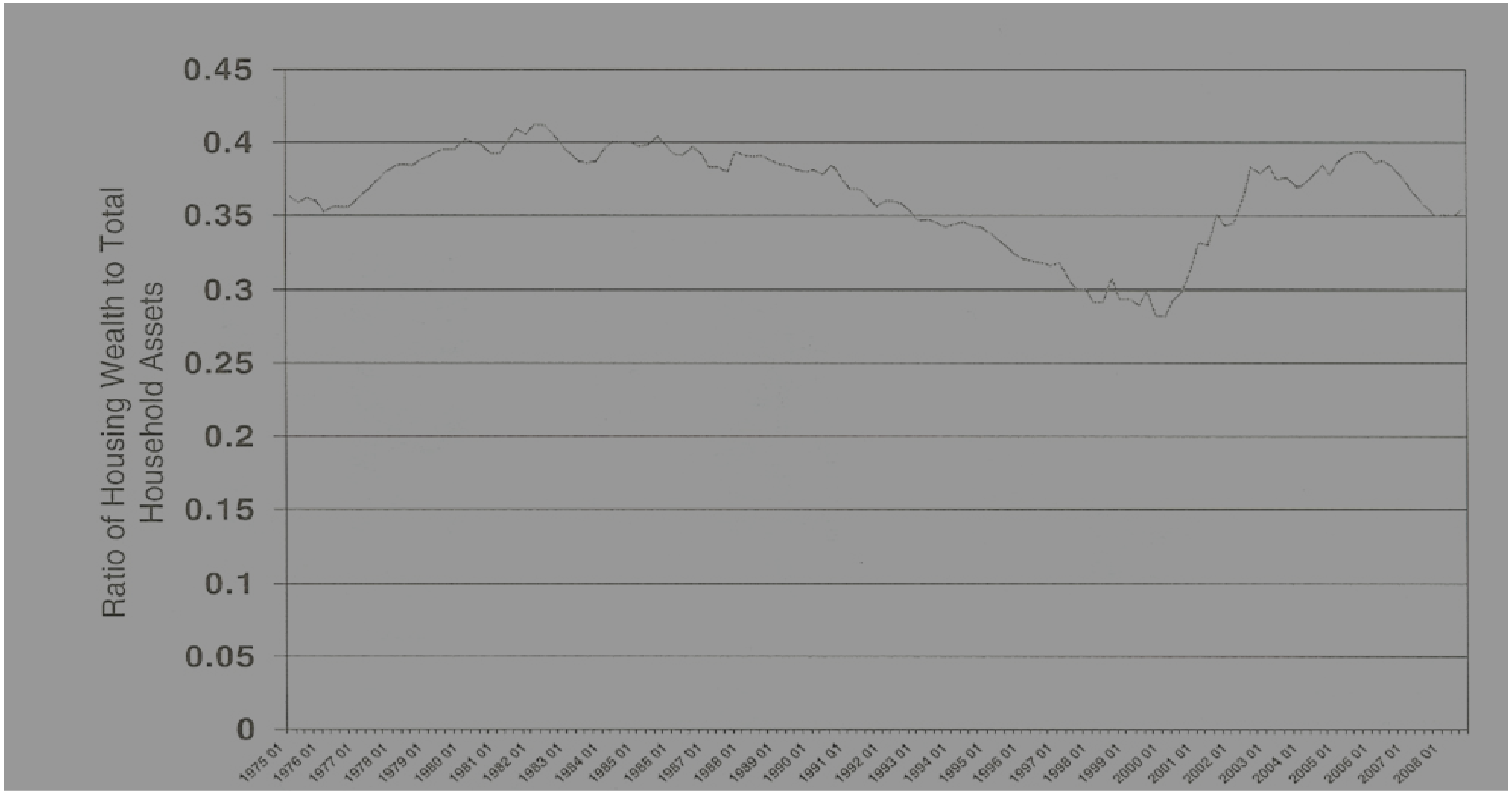
Source: New York University

House Price to Rent Ratio



Source: The Financial Crisis of 2007-2009: Causes and Remedies, by V.V. Acharya and M. Richardson, NYU Stern

Ratio of Housing Wealth to Total Household Assets, 1975- 2008



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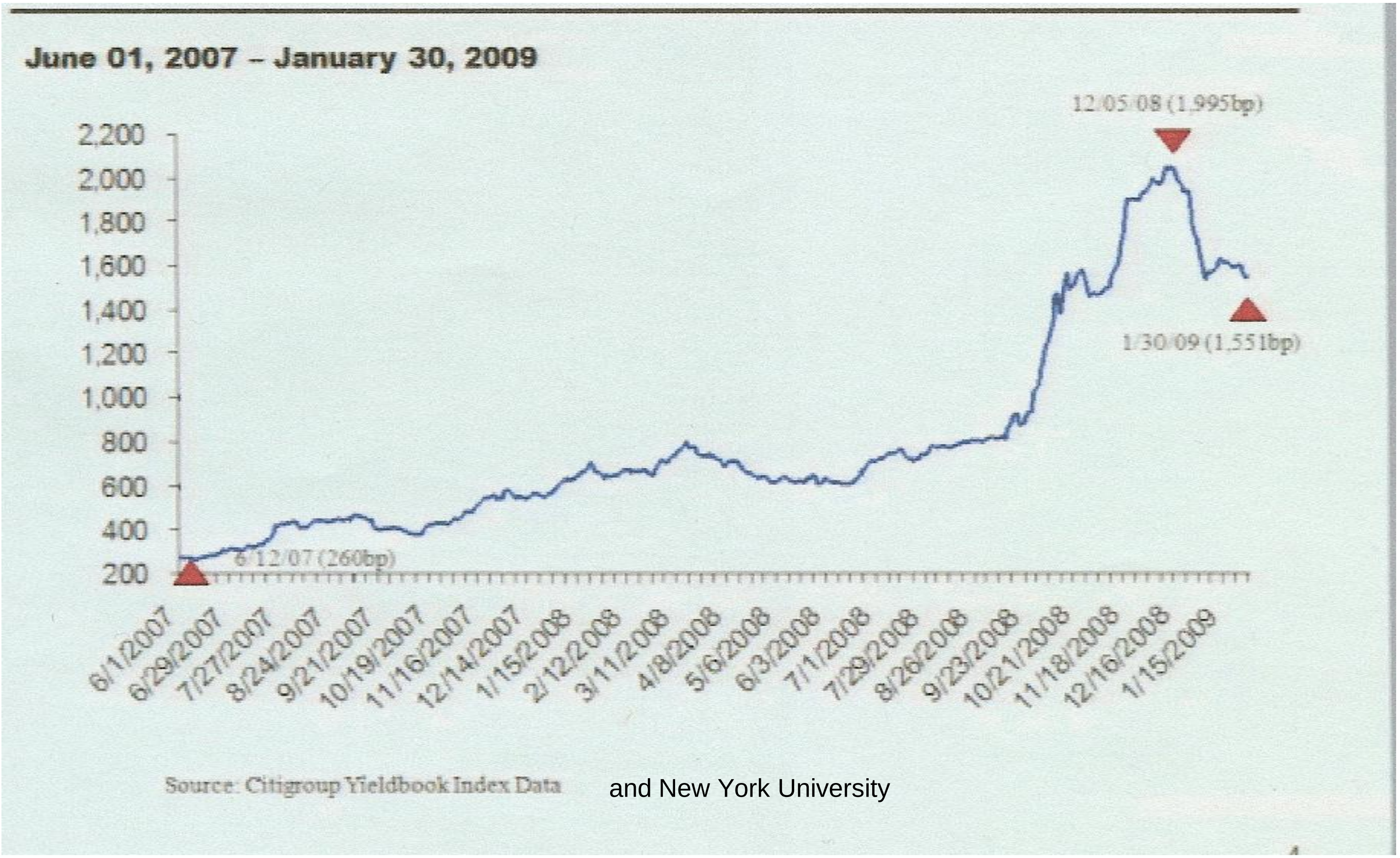
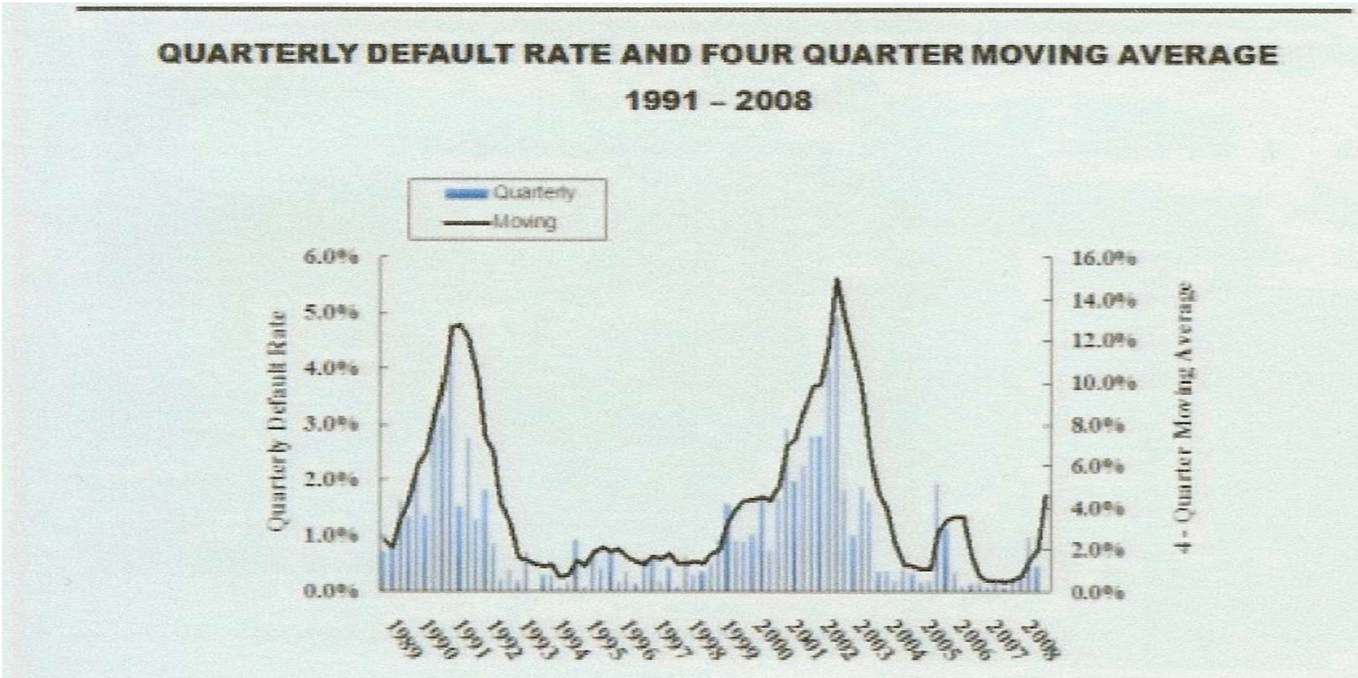
YTM Spread Between High Yield Markets & 10-Year Treasury Notes



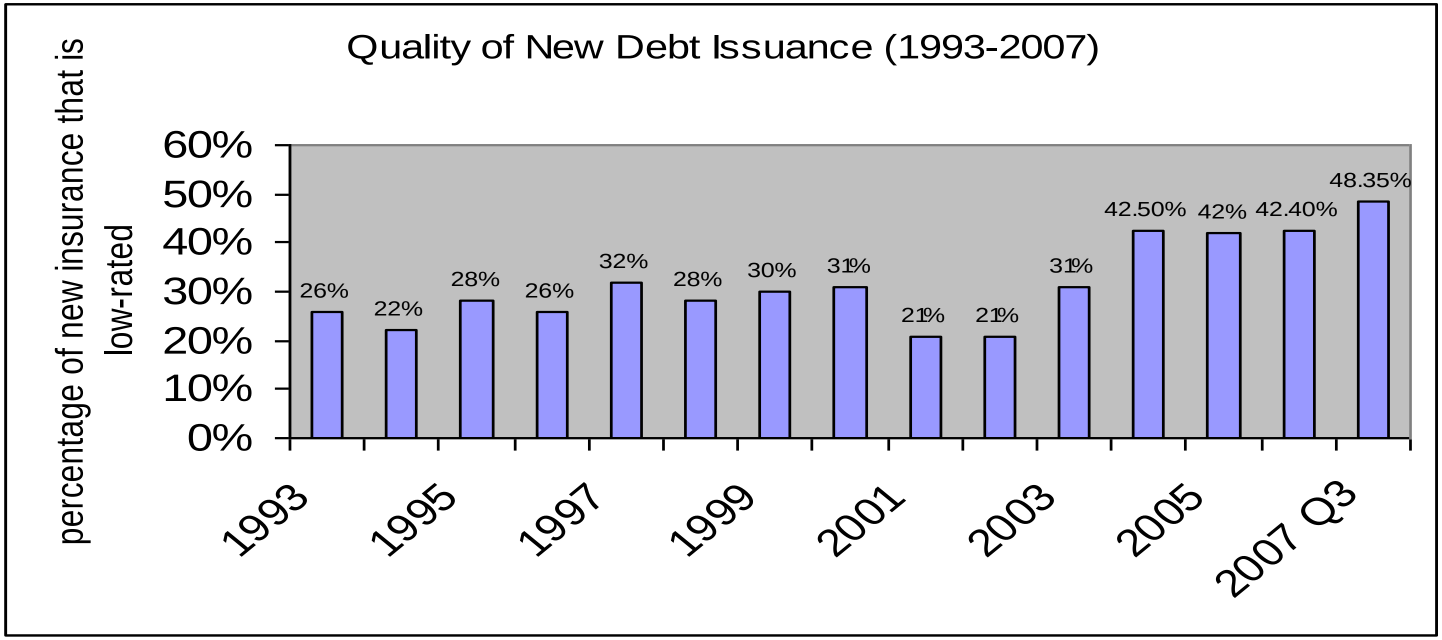
and New York University

Historical Default Rates



Source: Ed Altman, New York University

Quality of New Debt Issuance



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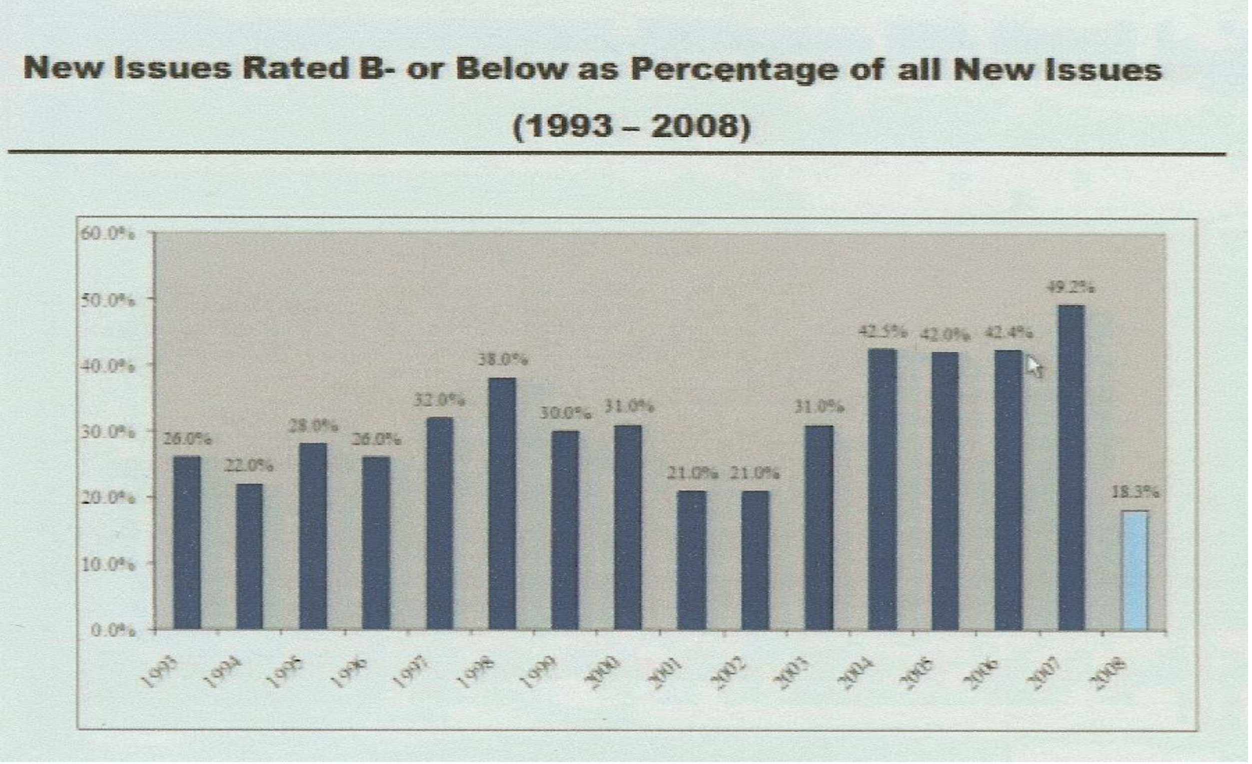
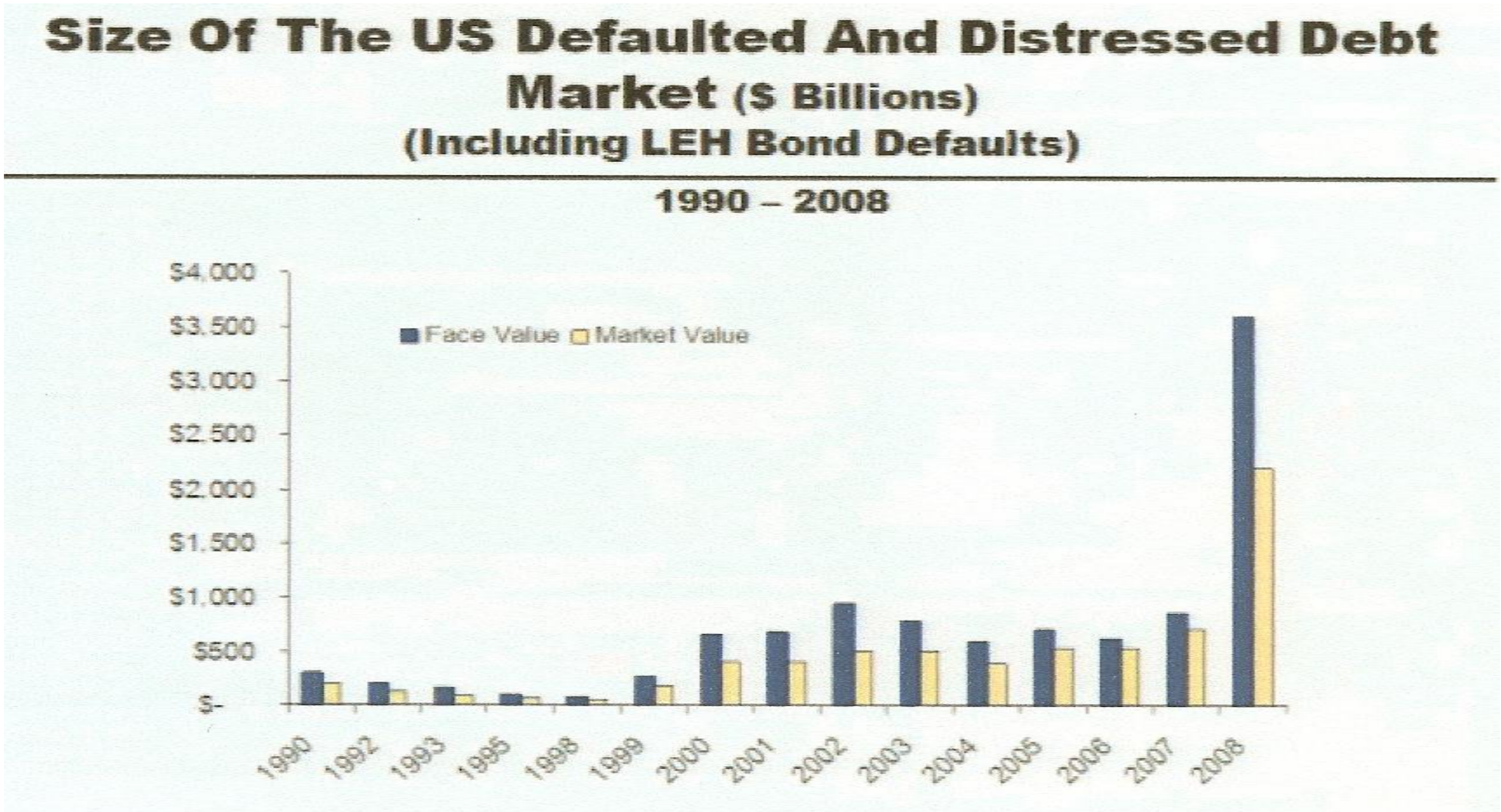
New Issues Rated B- or Below as Percentage of all New Issues



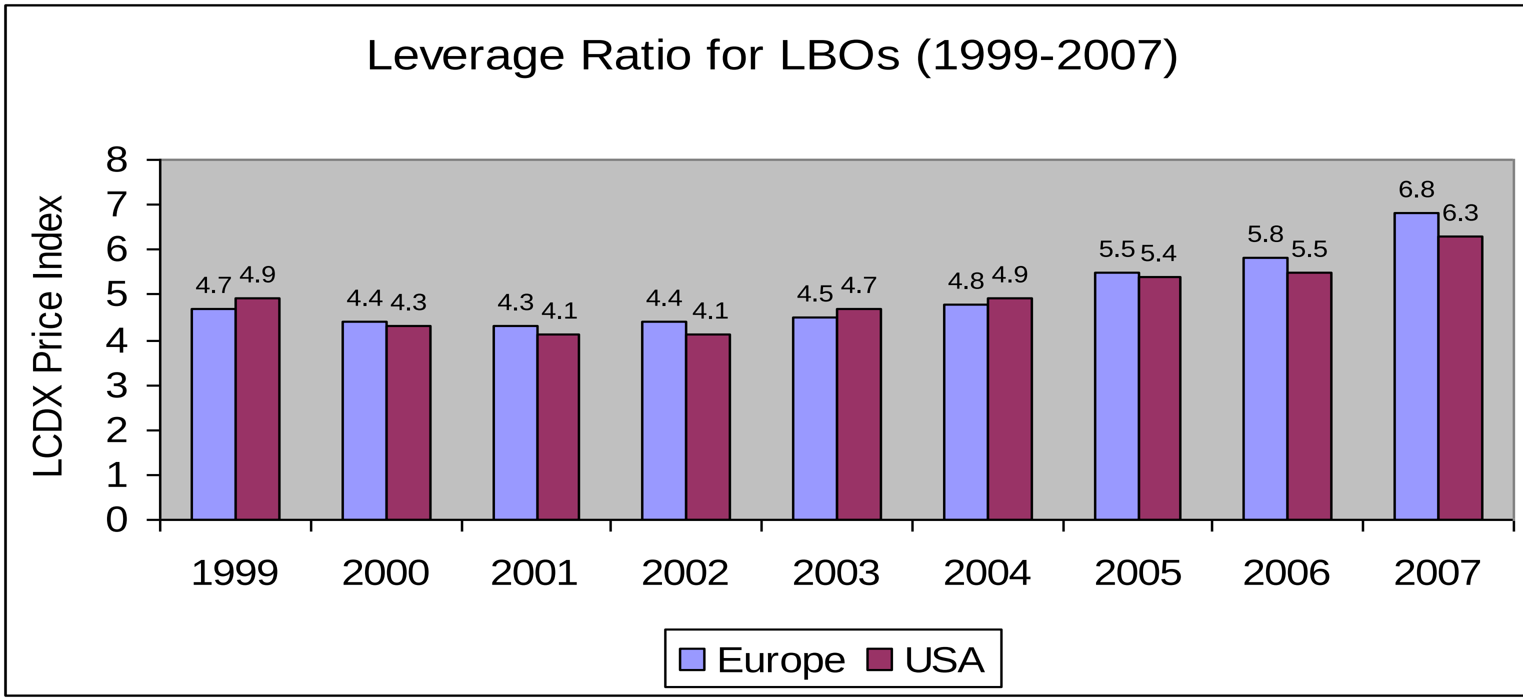
Source: Ed Altman, New York University

Size of the US Defaulted and Distressed Debt Market ($ Billions)



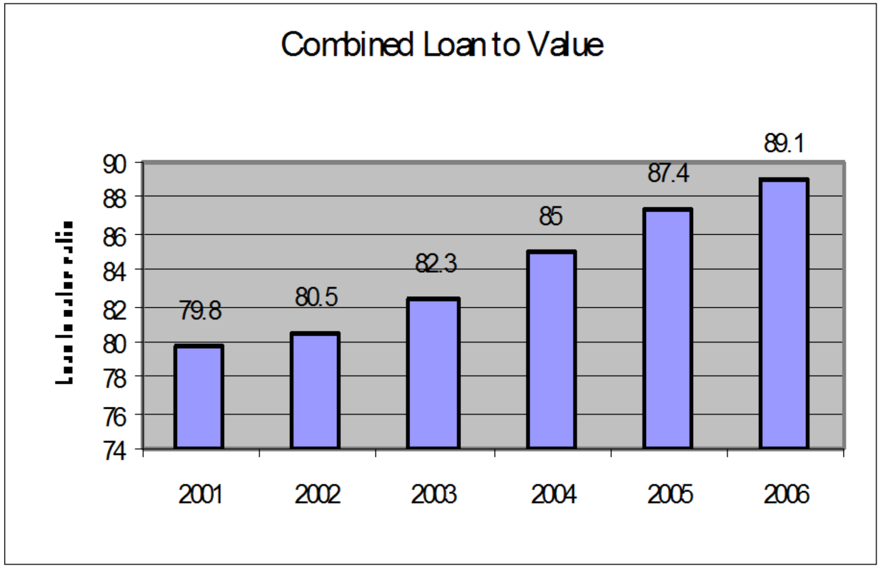
Source: Ed Altman, New York University

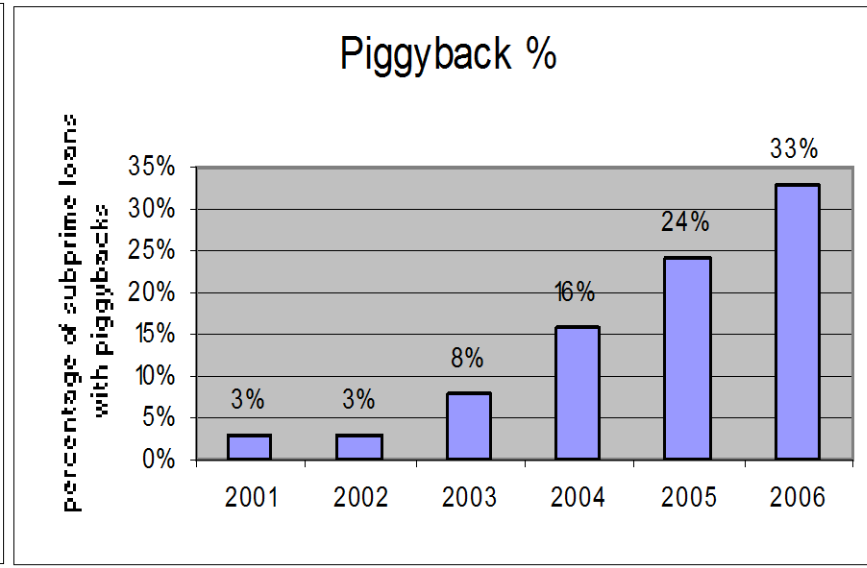
Leverage Ratios for LBOs

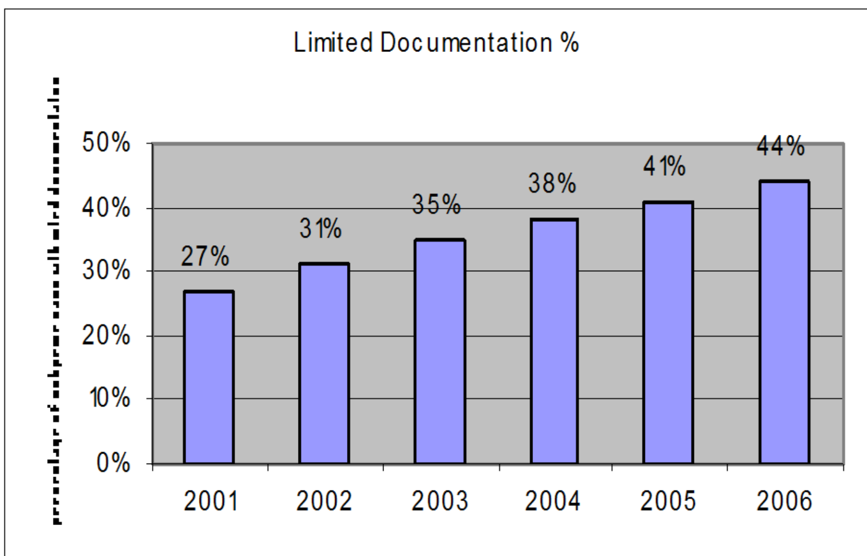


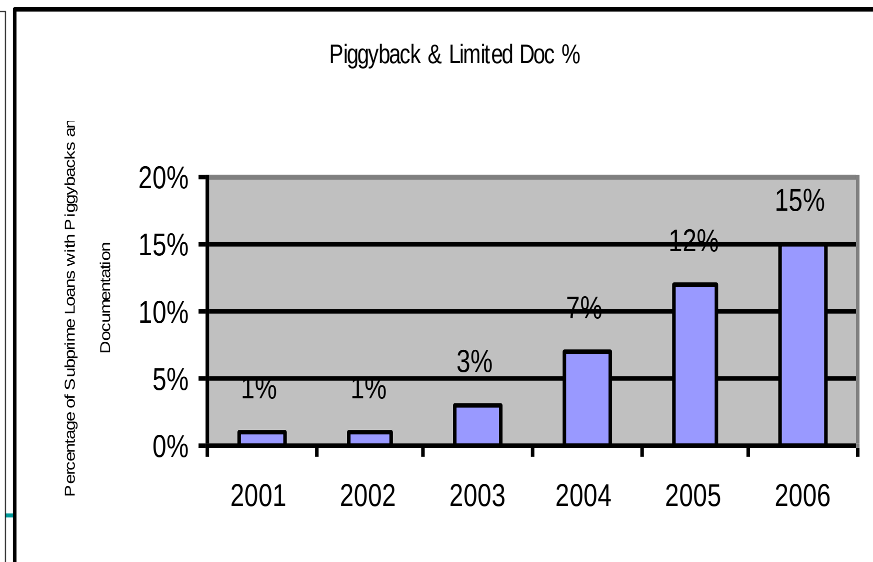
Source: The Financial Crisis of 2007-2009: Causes and Remedies, by V.V. Acharya and M. Richardson, NYU Stern

Quality and Design of Subprime Loans: to Reset in 2-3 years at Libor + 7% vs. 8%









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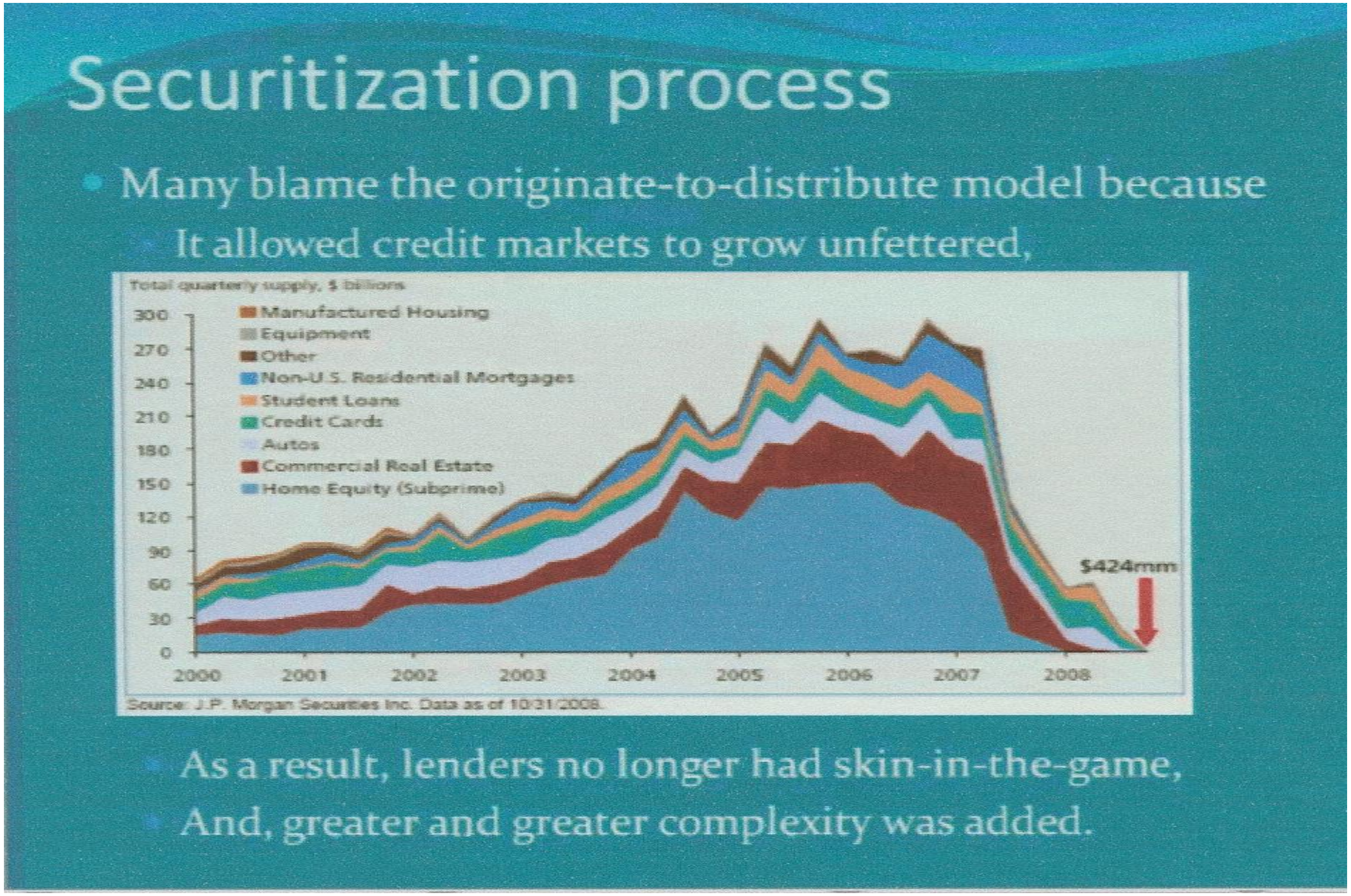
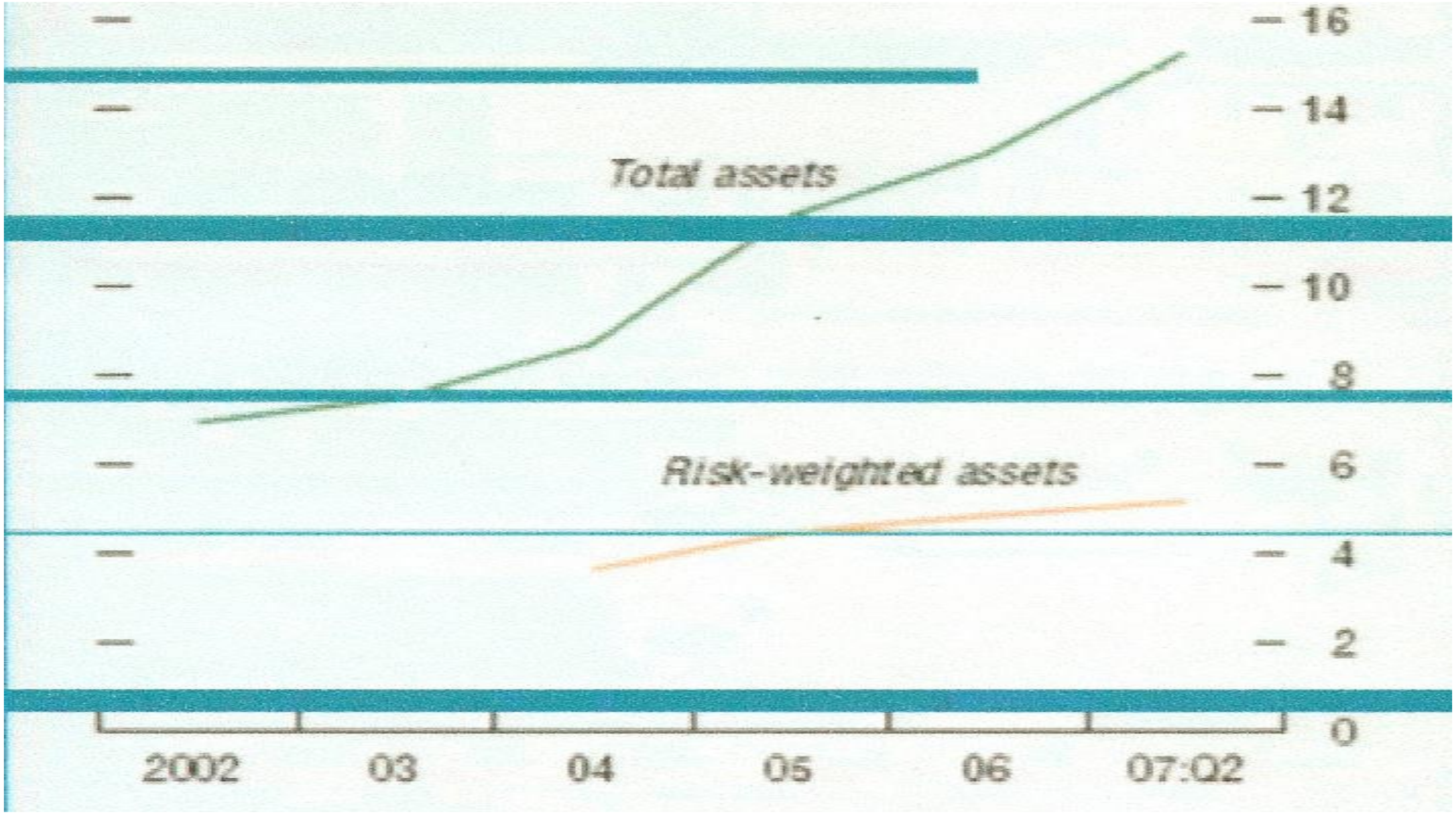
The Securitization Market



Source: Matthew Richardson, New York University

How Financial Institutions Levered Up: Growth in Total Assets and Risk-Weighted Assets: €Billions



Source: Matthew Richardson, New York University

The Unraveling

- The housing market turns in Q1 2006
- Subprime defaults start in late 2006 – early 2007
- In early-summer 2007, two highly-levered Bear-Stearns managed hedge funds that invested in ABSs, and CDSs, start suffering losses, and receive margin calls; Bear Stearns injects $3.2B worth of funds

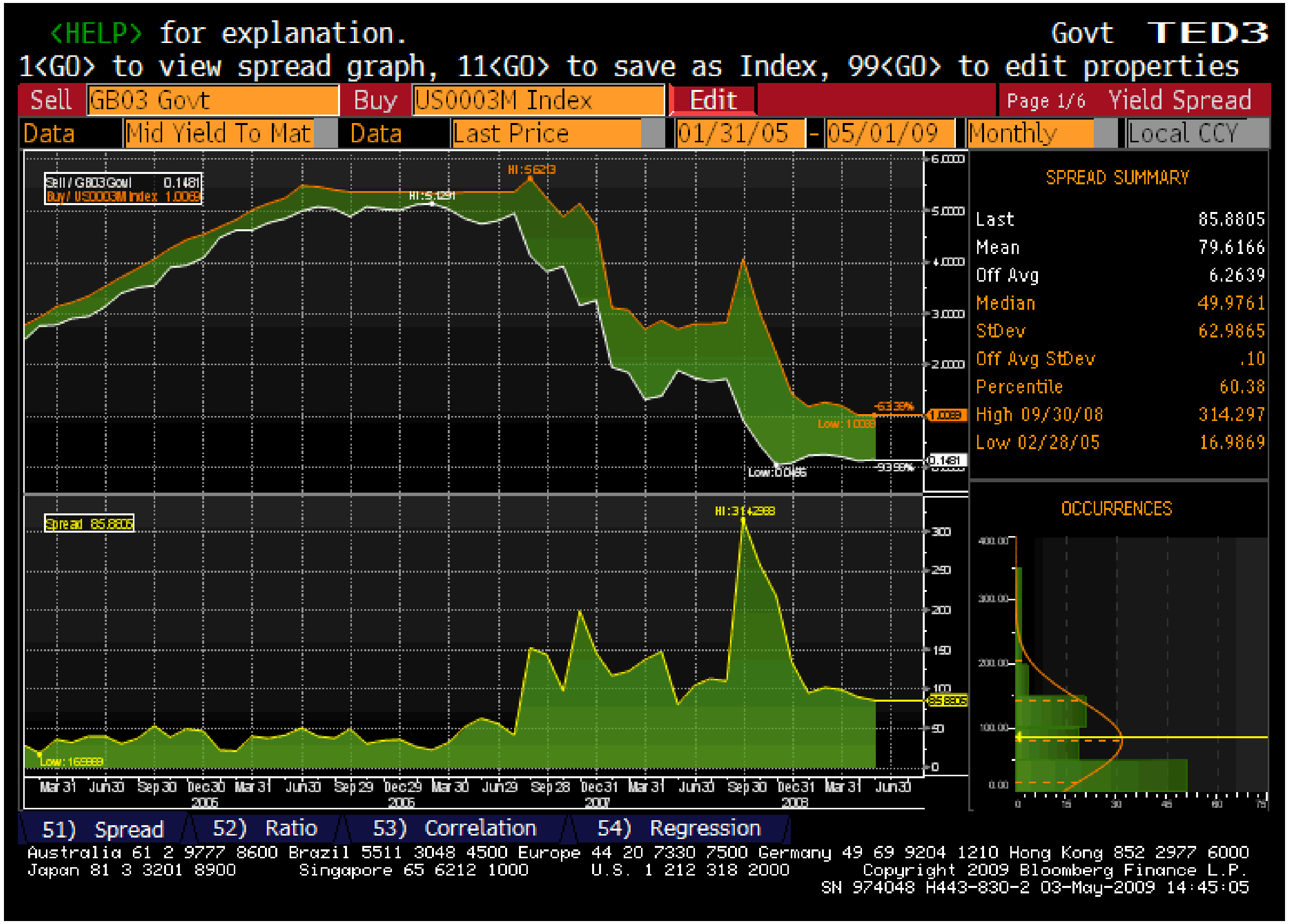
The Positive (Adverse) Feedback Loop

- The fall in the value of the bubbly asset backed by high leverage leads to margin calls, distressed sales of the bubbly asset, further declines in asset values, increased market value leverage, and a cascading vicious circle of falling asset prices, margin calls, fire sales, deleveraging, and further asset price deflation
- Complete re-pricing of all credit instruments
  - Investment grade bonds
  - High yield bonds
  - Leveraged loans via the LCDX index
  - CDOs backed by commercial mortgages via the CMBX
  - CDOs backed by subprime mortgages via the ABX

The Credit Markets Go into Cardiac Arrest

- High yield spreads increase by 200bp in six weeks
  - The decline in monthly leveraged loan volume
  - The increase in the High Yield Index
- The yen-to- A$/Kiwi carry trade moves by six sigma (annualized) in one day
- Similarly, The TED and OIS spreads move by approximately six sigma
- In the first week of August 2007, value, momentum, long-short equity, and statistical arbitrage hedge fund strategies suffer 25%-35% losses
- In August 2007, a run on the assets of three structured investment vehicles (SIVs) of BNP Paribas starts. BNP suspends redemptions. The Asset-Backed Commercial Paper Market (ABCPs) freezes

The Treasury-Eurodollar Spread

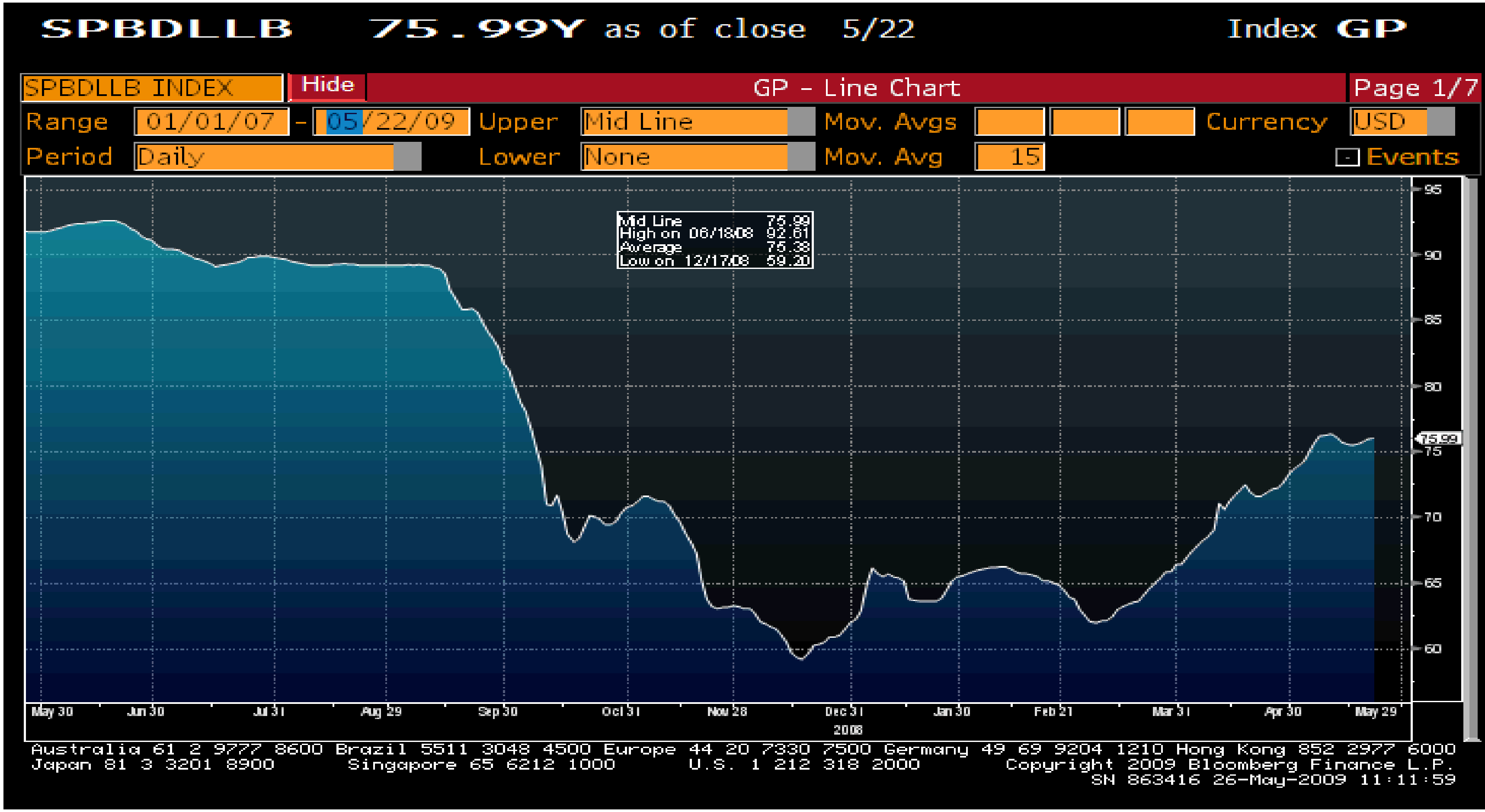


Source: Bloomberg

10-Year Leveraged Loan Index (Markit)

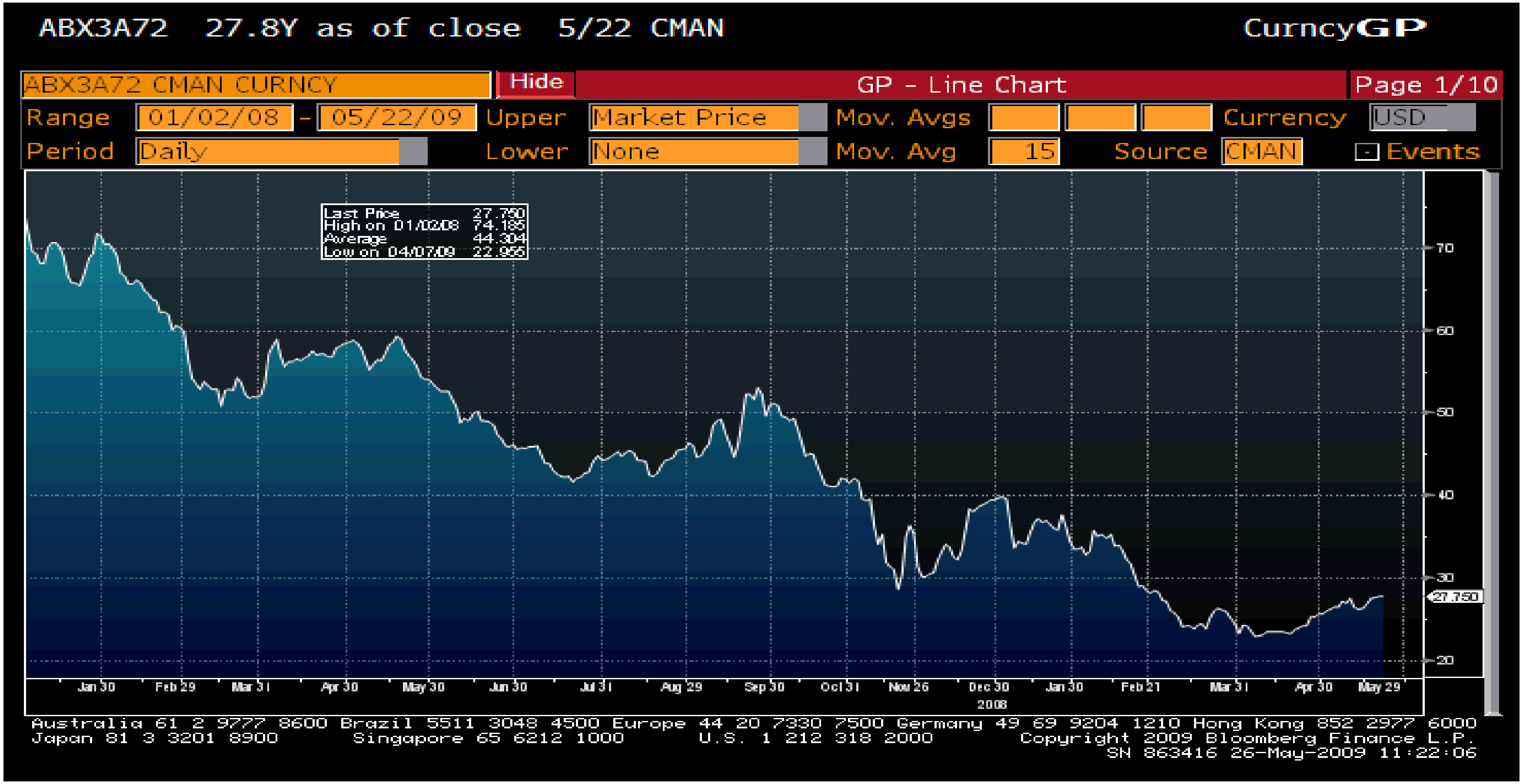
Source: Bloomberg

S&P Leveraged Debt Index



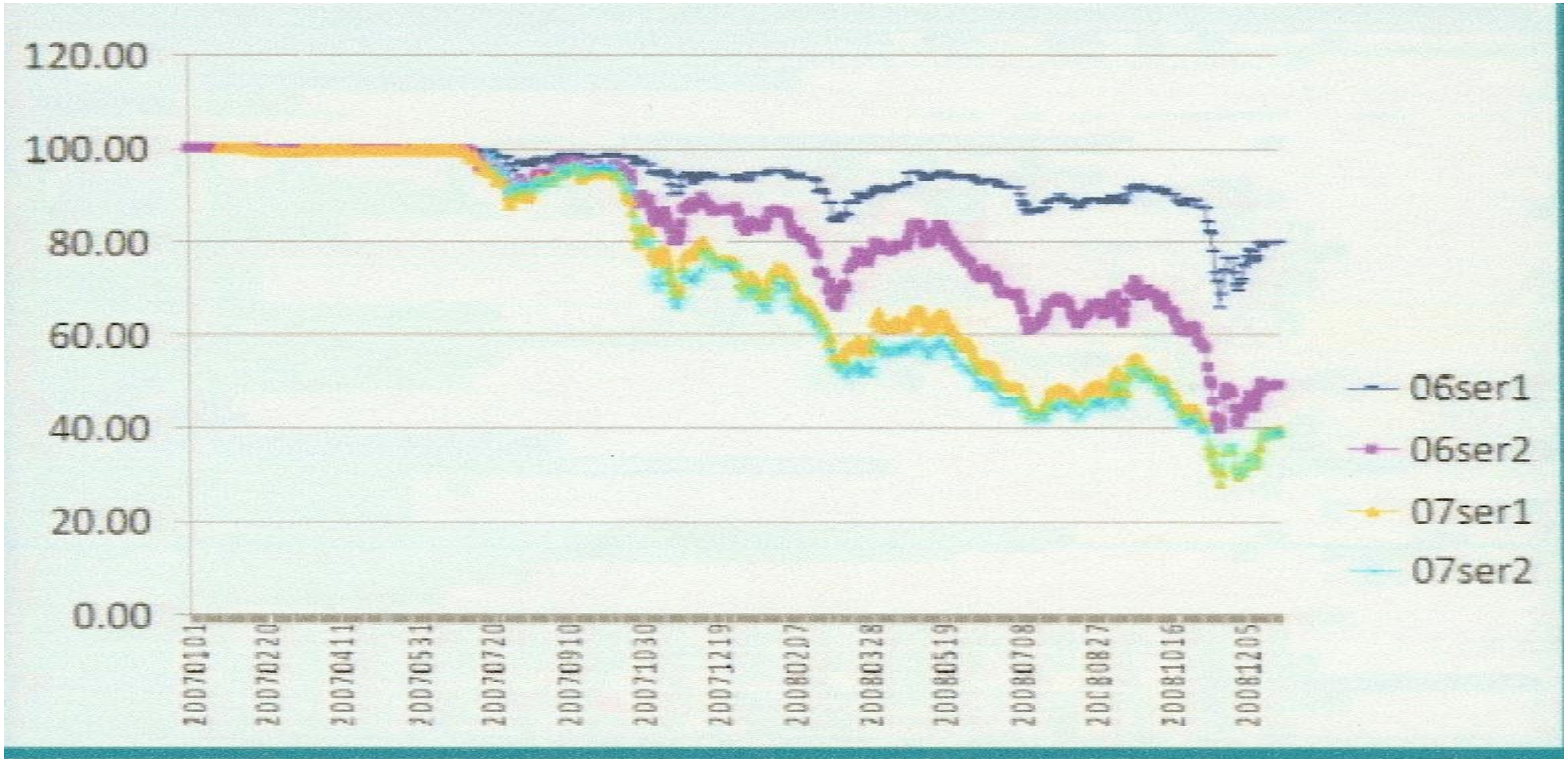
Source: Bloomberg

An ABX Index



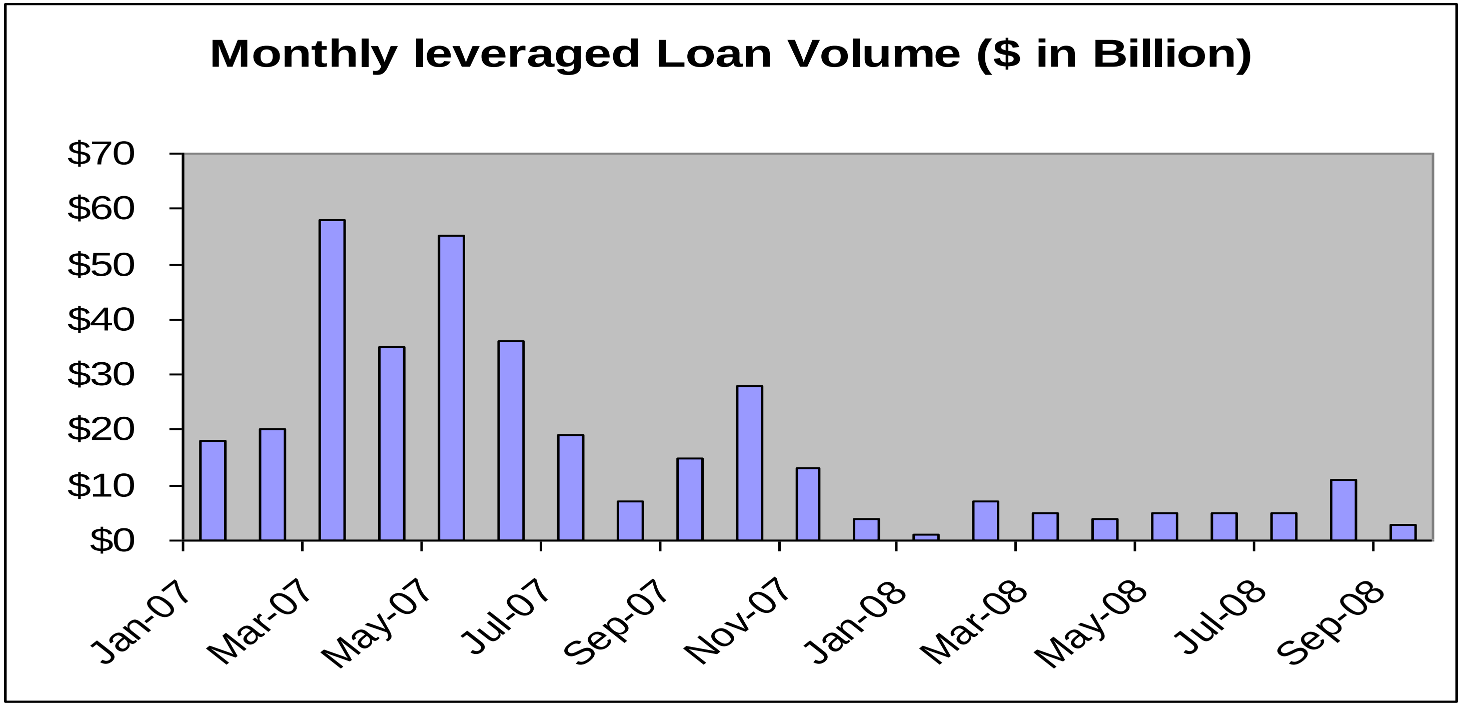
Source: Bloomberg

AAA Tranche of Subprime CDOs: Writing Put Options on the Market



Source: The Financial Crisis of 2007-2009: Causes and Remedies, by V.V. Acharya and M. Richardson, NYU Stern

Monthly Leveraged Loan Volume, Jan 2007-Sep 2008



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The Market Realizes the Following:

- (capital is fearful: *sermaye ürkektir*)
  - The existence of new exotic and illiquid financial instruments that are hard to value and price
  - Increasingly complex derivatives instruments
  - The fact that these instruments trade over the counter and not on exchanges
  - The revelation that there was little information about these financial instruments and who was holding them (witness the grilling of Bernanke by Congress of the counterparties to AIG's CDS contracts, now underwritten by the US Treasury)
  - The fact that balance sheets of many financial institutions were opaque with little or no regulation – including hedge funds, private equity, SIVs, other off-balance sheets conduits, and major financial institutions (e.g. the share price of Citi suggests that the market is valuing its assets at 25 cents to the $).

The Run on Bear Stearns and its Bailout, 10 March 2008

- The run on Bear, the fifth largest investment bank starts, major player in the $2.5Trillion repo market, the leading prime broker to hedge funds, and a significant participant on both sides of the CDS market
- During the weekend, the US Government helps engineer JP Morgan Chase's purchase of Bear by guaranteeing $29Billion of subprime-backed securities

Lehman Brothers Files for Bankruptcy the Weekend Following September 12th, 2008

- The regulators argue that they did not have the legal authority to save Lehman
- The market does not believe the regulators
- One of the largest money market funds, the Reserve Primary Fund, breaks the buck
- The US Government bails out AIG on Monday, Sep 15th
- The government forces Bank of America to buy Merrill
- Morgan Stanley and Goldman Sachs see their CDS protections rise from 250 and 200 bp to 997 and 620 bp within a week
- They eventually seek refuge at the Fed and become Banks

The Role and the Demise of the Shadow Banking Sector

- Borrowed short-term in rollover debt markets
- Leveraged significantly (sometimes close to 40 times)
- Lent and invested in longer term and illiquid assets
- Unlike banks, they did not have access until 2008 to the safety nets – deposit insurance and lender of last resort to the Central Bank – that had been designed to prevent a run on Banks
- How Warren Buffett rescued General Electric
- The theorem of unintended consequences

The Short-Term Policy Response: The Bailout Alphabet Soup

- Asset Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF)
- Money Market Investor Funding Facility (MMIFF)
- Commercial Paper Funding Facility (CPFF)
- Term Asset-Backed Securities Loan Facility (TALF)
- Troubled Assets Relief Program (TARP)
- A loan guarantee scheme administered by the FDIC
- The stress test and a compulsory bank recapitalization scheme undertaken by the US Treasury
- The Public Private Partnership Program to buy “legacy (toxic)” assets
- To intervene or not – the long vs. the short-term
- Milton Friedman: the history of finance is the history of expropriation; Roman Emperors, Ottoman Sultans, and the Fed: are they birds of the same feather?
- The outlook on inflation: the Fed’s balance sheet versus the output gap: who will win?
- And the endless series of debates…

More Complex Causes and Forward-Looking Regulatory Principles

- Risk taking
  - the principal-agent problem
    - traders' free option
    - securitization
    - corporate governance of Large Complex Financial Institutions (LCFIs)
    - CDSs and their effects on the capital structure tensions
- Moral hazard
  - mispriced explicit or implicit government guarantees
    - socializing risk and privatizing wealth
  - the too-big-to-fail problem
- Systemic vs. individual risk
  - internalizing externalities
- Transparency

Risk taking and corporate governance of LCFIs

- Regulators
- Boards
- Institutional activists
- Takeover market
- Debt holders
- Equity holders
  - Managers
    - Traders
      - Behavioral implications of having a cheap put

The Illusory Alpha Trade

- Go long spread trades
  - AAA tranches of CDOs, or other instruments
  - On the run vs. off the run treasuries a la LTCM
  - Italian lira vs. Deutsche mark a la LTCM
- Ignore liquidity risk and credit risk of “safe” securities
- Book these premiums as profit and ignore long-term possibility of these securities declining
- Bonuses paid directly off these profits
- Larger the balance sheet, the larger the bonuses
- Big problem
  - Almost no idiosyncratic risk; all systemic as AAA only gets hit when everything goes down

Mispriced guarantees infect the entire system

- Too big to fail (TBTF)
  - Moral hazard of being a Large Complex Financial Institution (LCFI) and incentive to become one (Citi trying to buy Wachovia in the middle of the crisis)
- Mispriced guarantees, e.g., deposit insurance
- Zero-priced guarantees of Government Sponsored Enterprises (GSEs)
  - Held $1.5T of MBSs with 15% in subprime
  - Leverage 25:1; so 4% drop in portfolio wipes out equity
  - High leverage because of gov't guarantee; yield just above gov't
  - Systemic risk
    - Firesales
    - Counterparty risk ($2T in OTC derivatives)

The Balance Sheet of a GSE

Assets	Liabilities
$100	$95 (Gov’t guaranteed debt)
	$5 (Equity)

- The gov’t guarantee keeps the cost of debt down and does not provide a feedback loop to check the size of the balance sheet
- Under “normal” conditions the equity holder and the managers privatize the returns of the GSE
- Under duress, the gov’t takes the GSE into conservatorship

Systemic vs. Individual Risk

- LCFIs produce a negative externality, like pollution
  - A special regulator for LCFIs
  - Measurement of systemic risk
  - Pricing systemic risk
    - Capital requirements a la Basel III
    - FDIC-like premium which includes systemic risk as a factor
    - Buying insurance
      - Against own losses in aggregate bad state scenario
      - Payouts go to a “bailout” fund
      - Private sector-offered insurance for x%, government covers the rest

Lack of Transparency

- LCFIs
  - Complexity due to size, off-balance sheet items, multiple business lines
  - The return of Glass-Steegal II
- Shadow banking system
  - Runs on the system
  - Investment banks
  - SIVs
  - Money market funds
  - Hedge funds
  - Private equity shops
- OTC derivatives
  - Counterparty risk via bilateral trades
  - Reduce this risk by forming exchanges
- How CDSs create an adverse incentive problem
  - Holders of CDSs would want the firm to go bankrupt as opposed to debt holders

The Healing Process: Credit Markets Recover First

Source: Bloomberg

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