RiskMetrics Group
The Center for the Financial Community

Navigating The Global Credit Crisis

Origins, Lessons, and Looking Ahead

Hong Kong, June 4, 2009

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Agenda

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Brief History & Macro View

Subprime Case Studies

Looking Ahead

Brief History

Significant growth in subprime lending starting in 2002 fuelled by low rates & easy credit

Home values started declining in the second half of 2006 leading to increased delinquencies and defaults

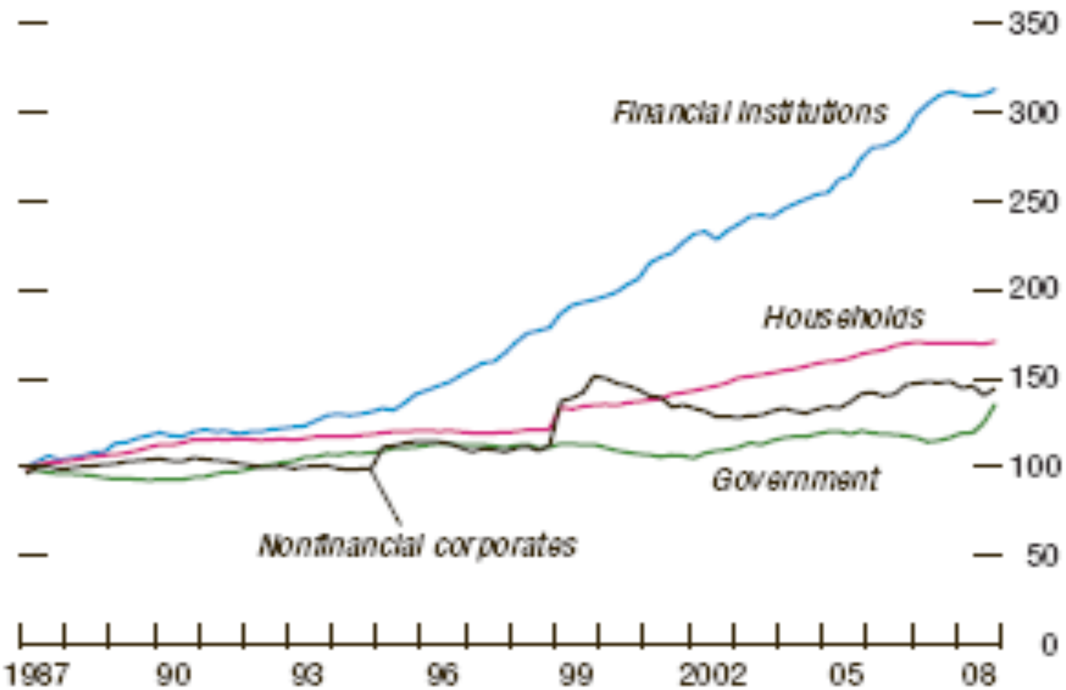
Losses on loans had a direct adverse impact on market values and liquidity of RMBS and CDO's linked to subprime loans

The subprime crisis spread to the broader credit market first and then to the economy as a whole

Mortgage brokers, loan originators, underwriters, and credit rating agencies (CRA) involved in subprime deals have come under scrutiny for their role in the build up of this market

Major expansion of global leverage, especially amongst financials and households

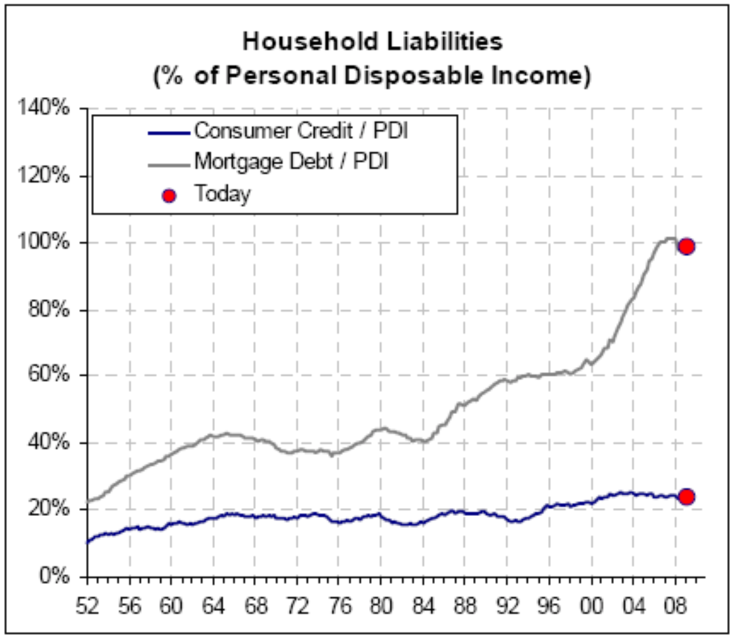
Figure 1.3. Ratio of Debt to GDP Among Selected Advanced Economies
(In percent, GDP-weighted, 1987 = 100)

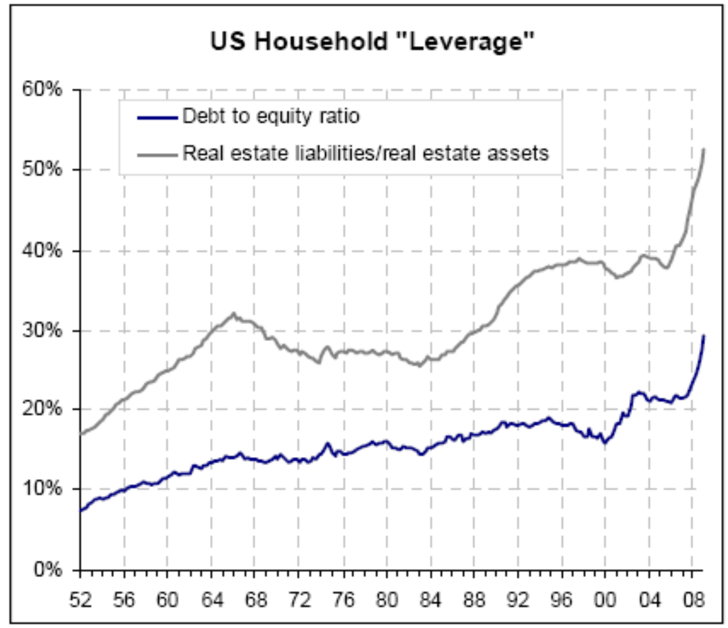


Sources: Bank of Japan; Bureau of Economic Analysis; Federal Reserve; Office of National Statistics; and IMF staff estimates.

Source: IMF Global Financial Stability Report, April 2009

Unsustainable growth of U.S. household Leverage





Source: Federal Reserve, BLS and TRG calculations

…According to the Case-Shiller Index, home prices in the US increased by 75% between 2003 and late 2006, the real estate debt to equity ratio of the average US household went from less than 40% in the late 90's to 60% in 2008

Source: The Rohatyn Group, Emerging Markets In the Global Crisis *A Medium Term Outlook , May 2009*

"Loose fitting" monetary policy from 2002 to 2005

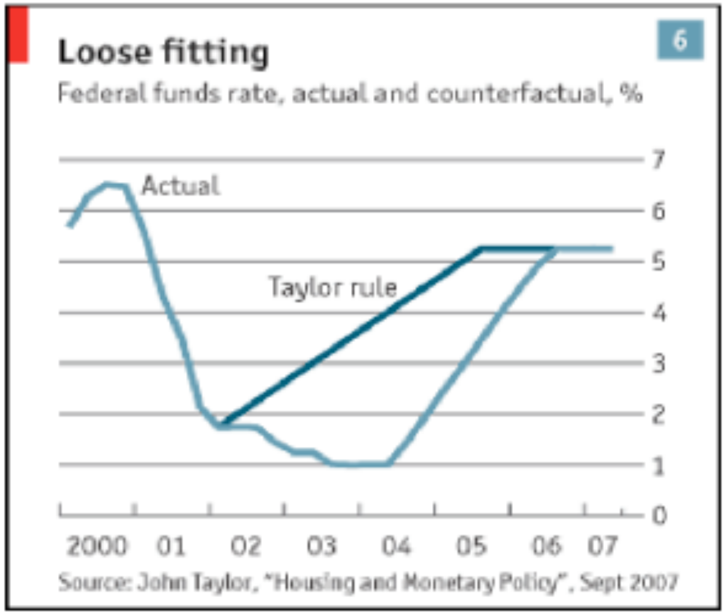


Chart from *The Economist*, October 18, 2007

Source: John B. Taylor, "THE FINANCIAL CRISIS AND THE POLICY RESPONSES: AN EMPIRICAL ANALYSIS OF WHAT WENT WRONG," January 2009. http://www.nber.org/papers/w14631

Easy money fuelled the U.S. housing bubble

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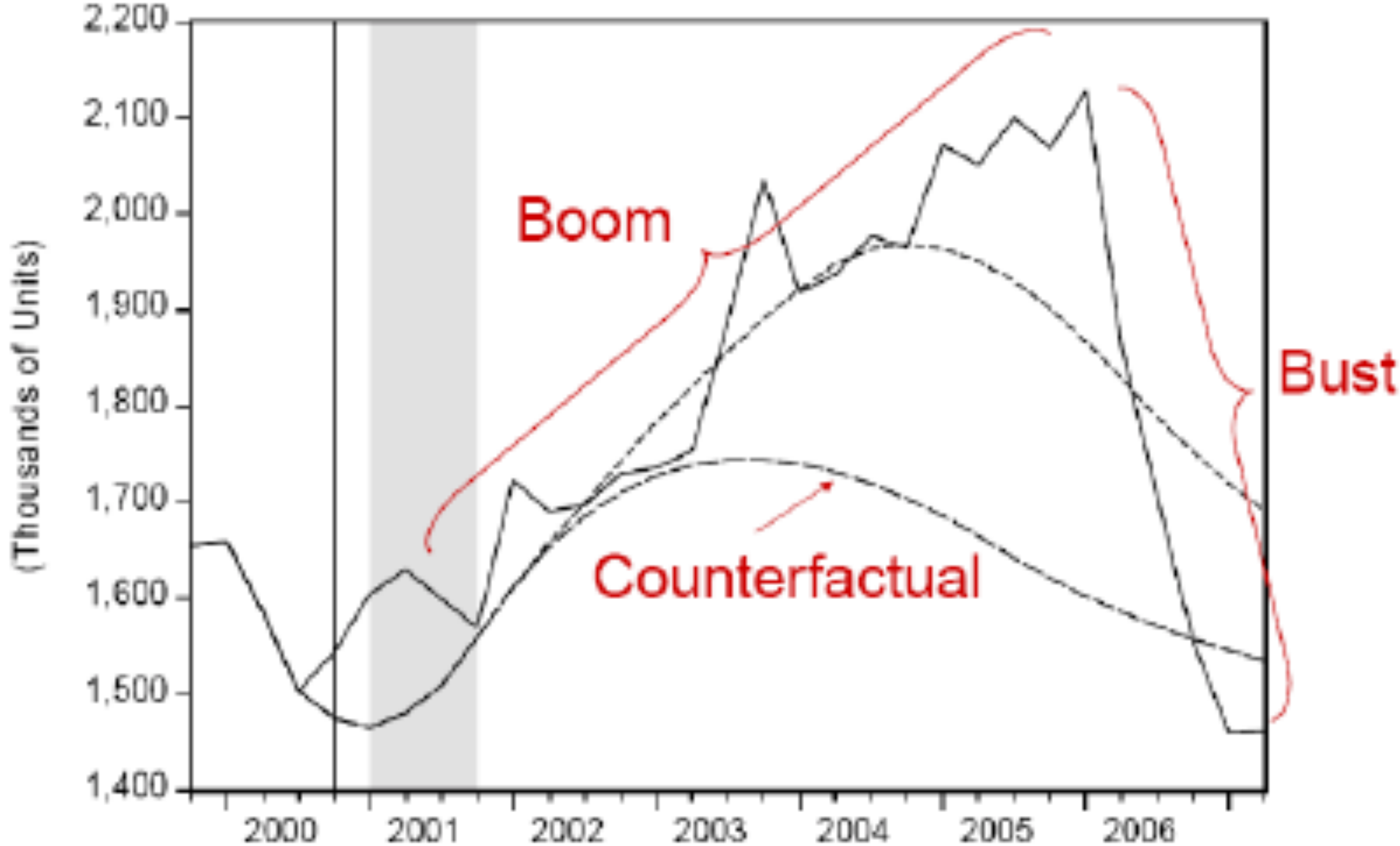

The Boom-Bust in Housing Starts Compared With the Counterfactual.

(The line with shorter dashes shows *model* simulations with the actual interest rate.)

Source: John B. Taylor, "THE FINANCIAL CRISIS AND THE POLICY RESPONSES: AN EMPIRICAL ANALYSIS OF WHAT WENT WRONG," January 2009. http://www.nber.org/papers/w14631

… and the Taylor rule fits in Europe

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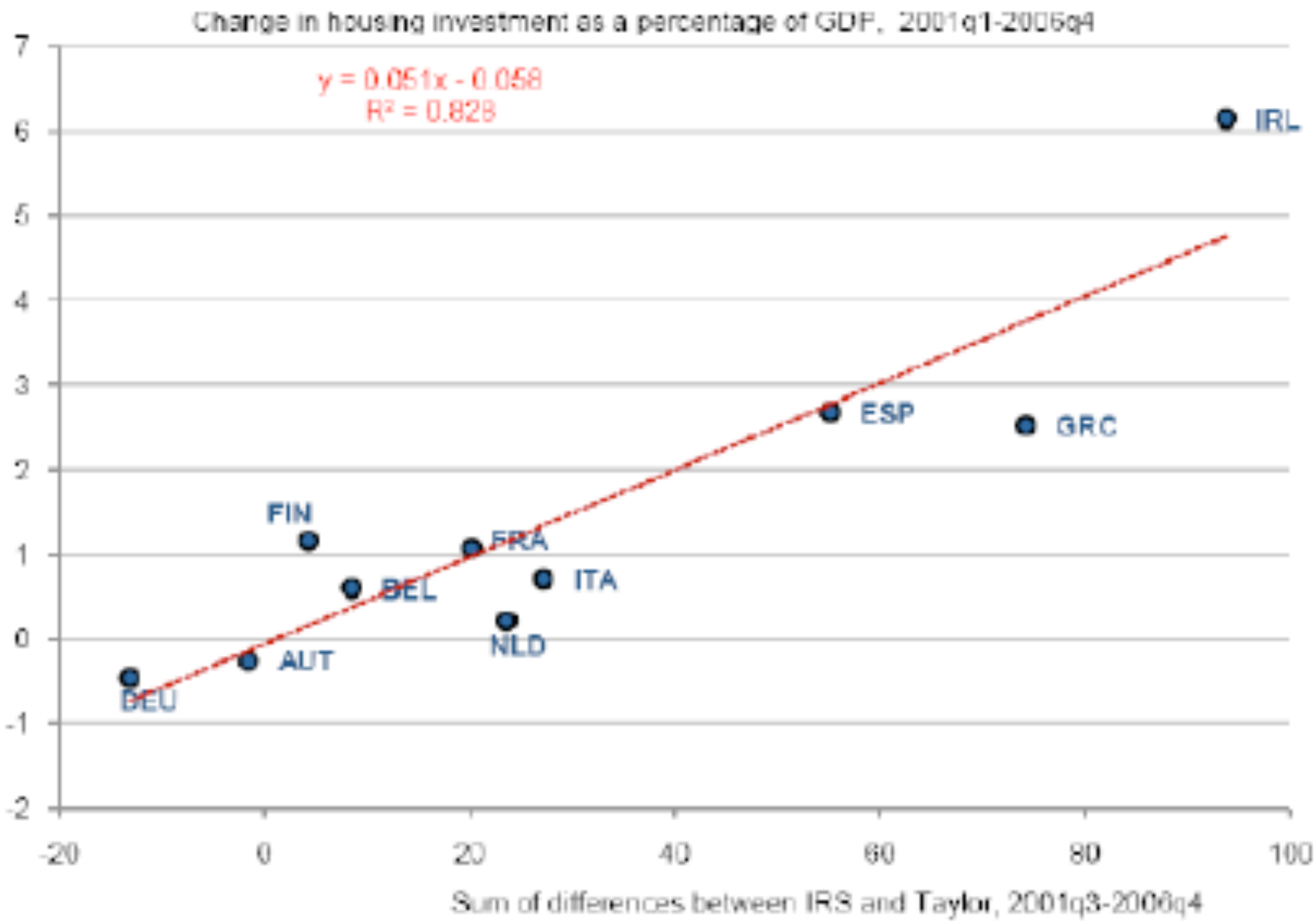

Housing Investment Versus Deviations From the Taylor Rule in Europe

Source: John B. Taylor, "THE FINANCIAL CRISIS AND THE POLICY RESPONSES: AN EMPIRICAL ANALYSIS OF WHAT WENT WRONG," January 2009. http://www.nber.org/papers/w14631

Inverse relationship between house price inflation and foreclosure rates, especially on subprime ARM

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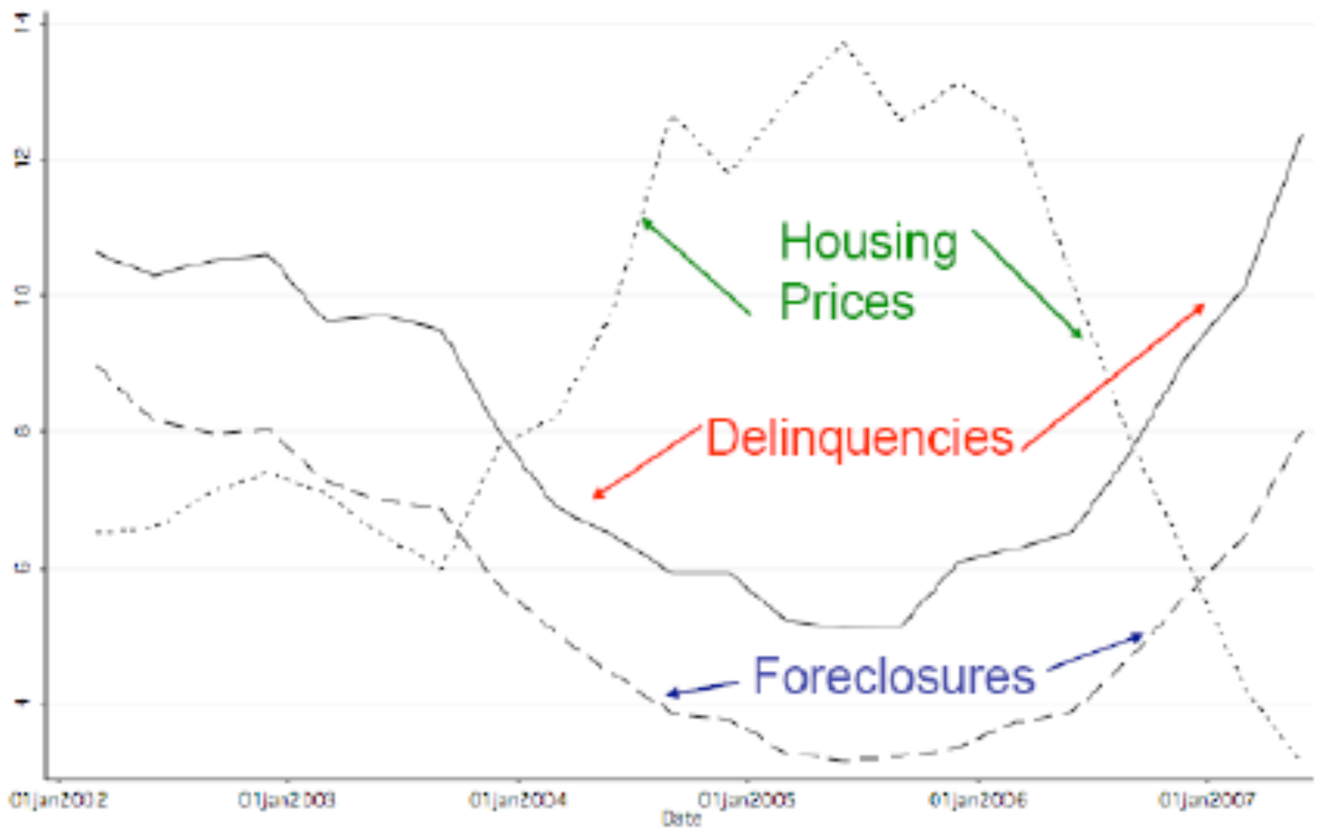

Housing Price Inflation and Subprime ARM Delinquencies and Foreclosures

Source: John B. Taylor, "THE FINANCIAL CRISIS AND THE POLICY RESPONSES: AN EMPIRICAL ANALYSIS OF WHAT WENT WRONG," January 2009. http://www.nber.org/papers/w14631

Policy Response: Liquidity or Counterparty Risk?

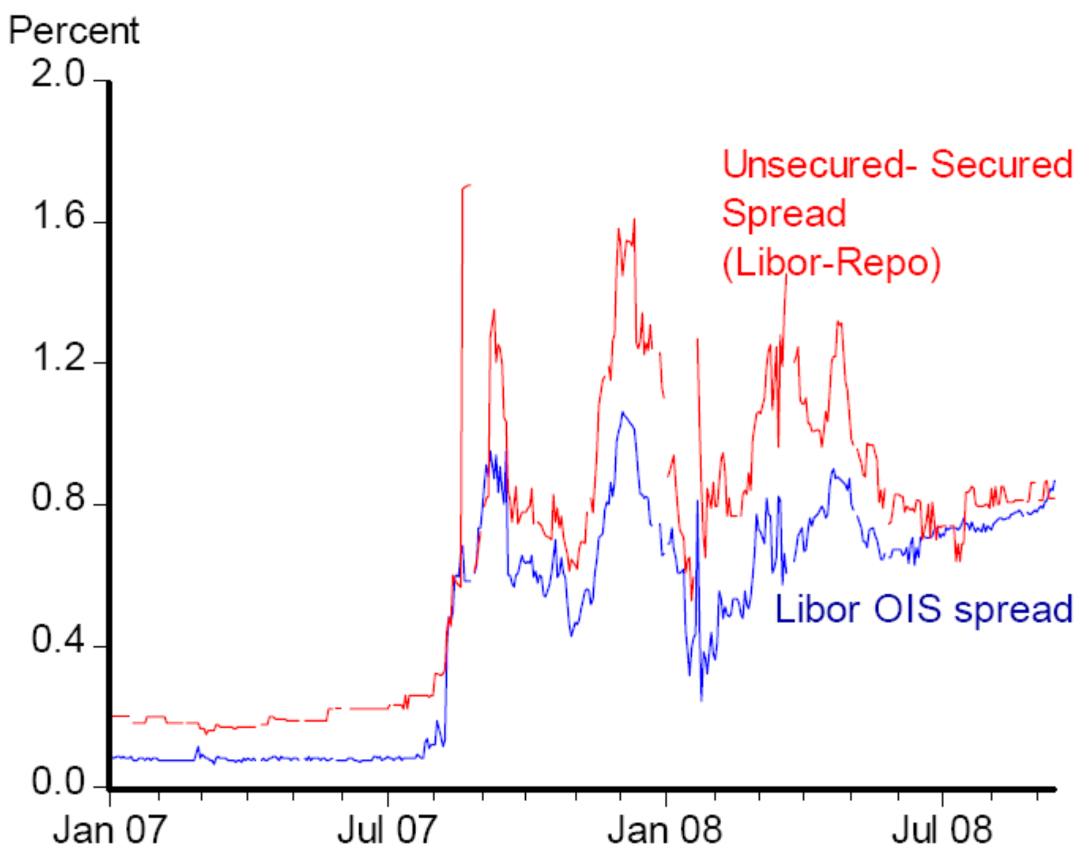

Figure 8. Counterparty Risk Explained Most of the Variation

Source: John B. Taylor, "THE FINANCIAL CRISIS AND THE POLICY RESPONSES: AN EMPIRICAL ANALYSIS OF WHAT WENT WRONG," January 2009. http://www.nber.org/papers/w14631

Impact of TAF on LIBOR OIS Spreads

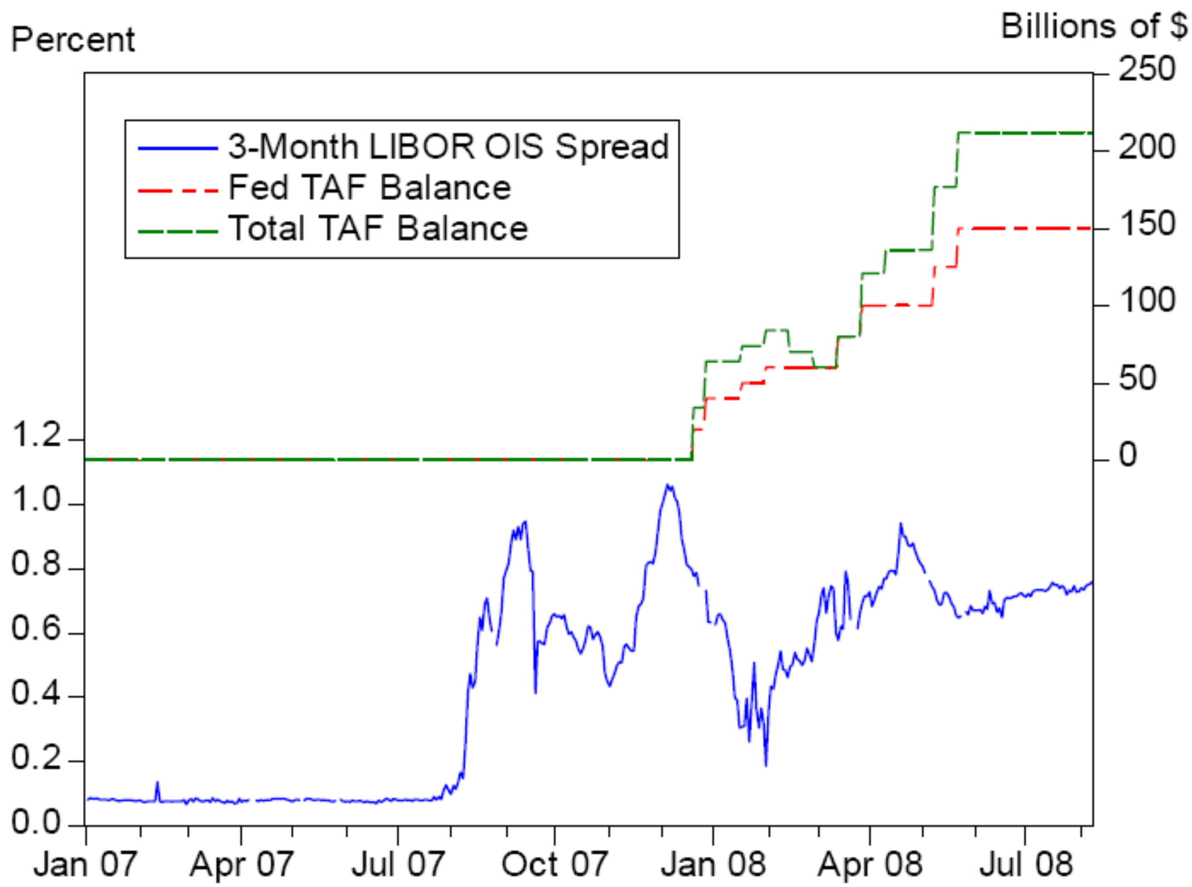

Figure 9. The Term Auction Facility Had Little Impact on the Spread

Source: John B. Taylor, "THE FINANCIAL CRISIS AND THE POLICY RESPONSES: AN EMPIRICAL ANALYSIS OF WHAT WENT WRONG," January 2009. http://www.nber.org/papers/w14631

Tax Rebates Fail To Spur Consumption

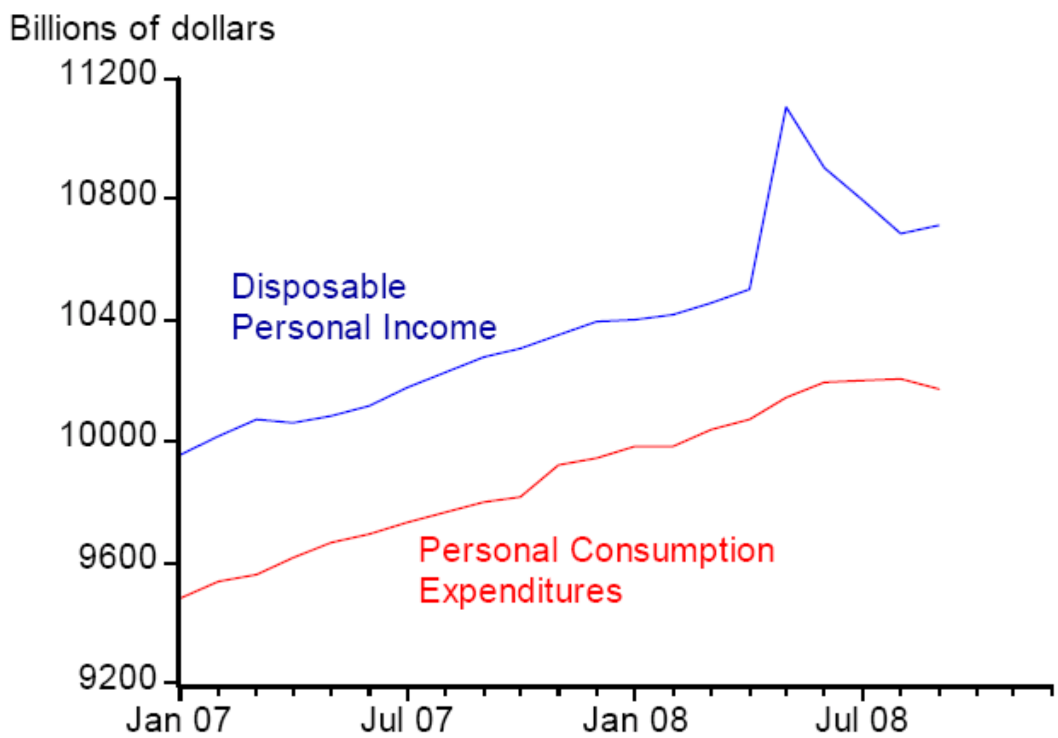

Figure 10. The Rebates Increased Income, But Not Consumption.
(Monthly data, seasonally adjusted, annual rates).

Source: John B. Taylor, "THE FINANCIAL CRISIS AND THE POLICY RESPONSES: AN EMPIRICAL ANALYSIS OF WHAT WENT WRONG," January 2009. http://www.nber.org/papers/w14631

Another unfortunate consequence of the Fed's aggressive interest rate cuts: oil spike

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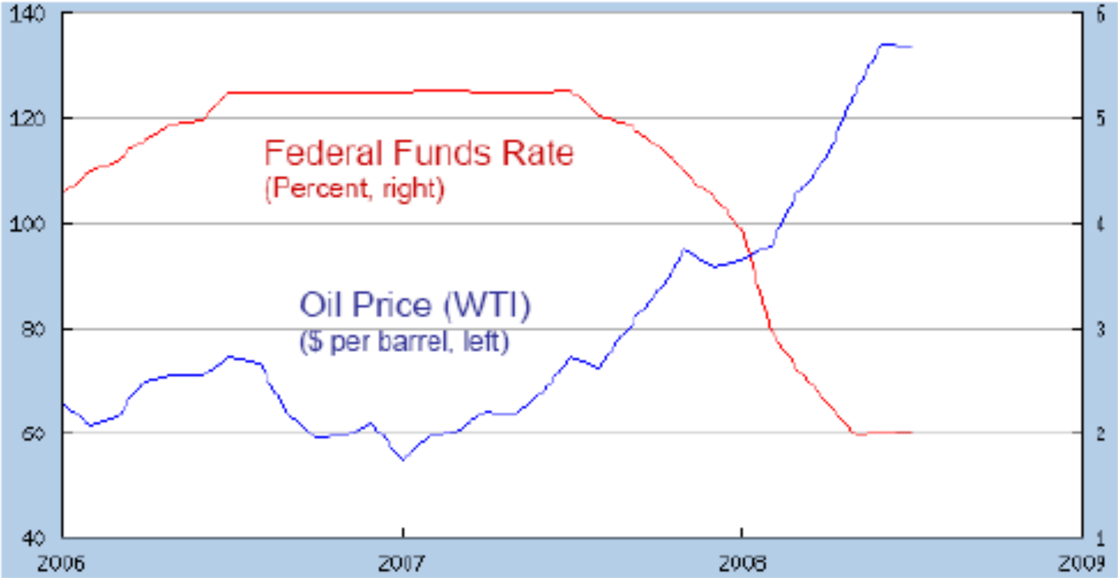

The Sharp Cut in Interest Rates Was Accompanied by a Rapid Increase in Oil Prices Through the First Year of the Crisis.

(Last observation is July 2008)

Source: John B. Taylor, "THE FINANCIAL CRISIS AND THE POLICY RESPONSES: AN EMPIRICAL ANALYSIS OF WHAT WENT WRONG," January 2009. http://www.nber.org/papers/w14631

Mortgage Delinquencies and U.S. Loan Charge Offs

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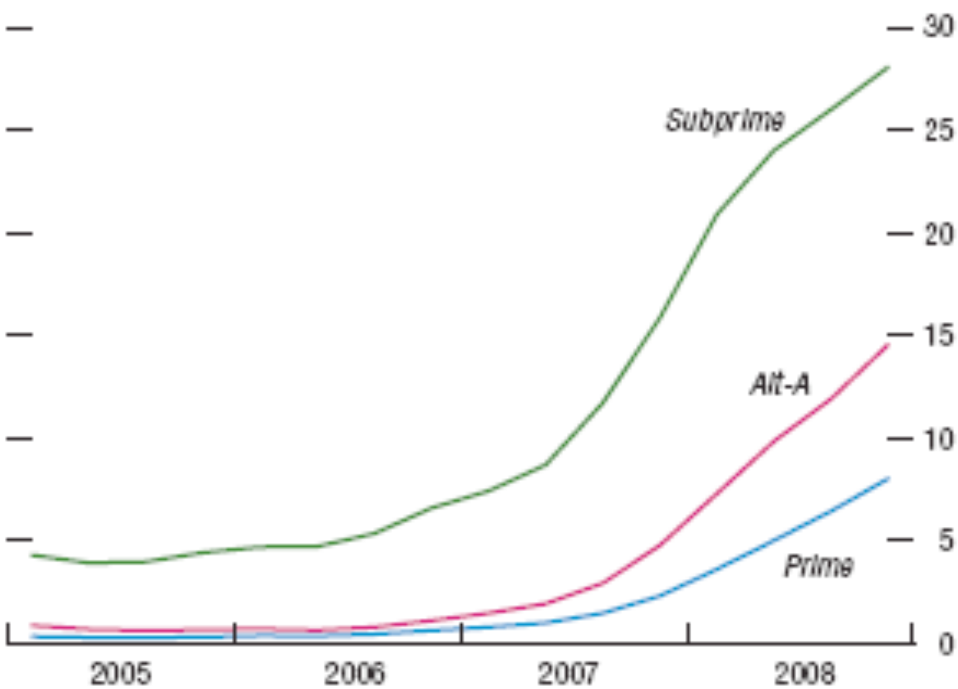
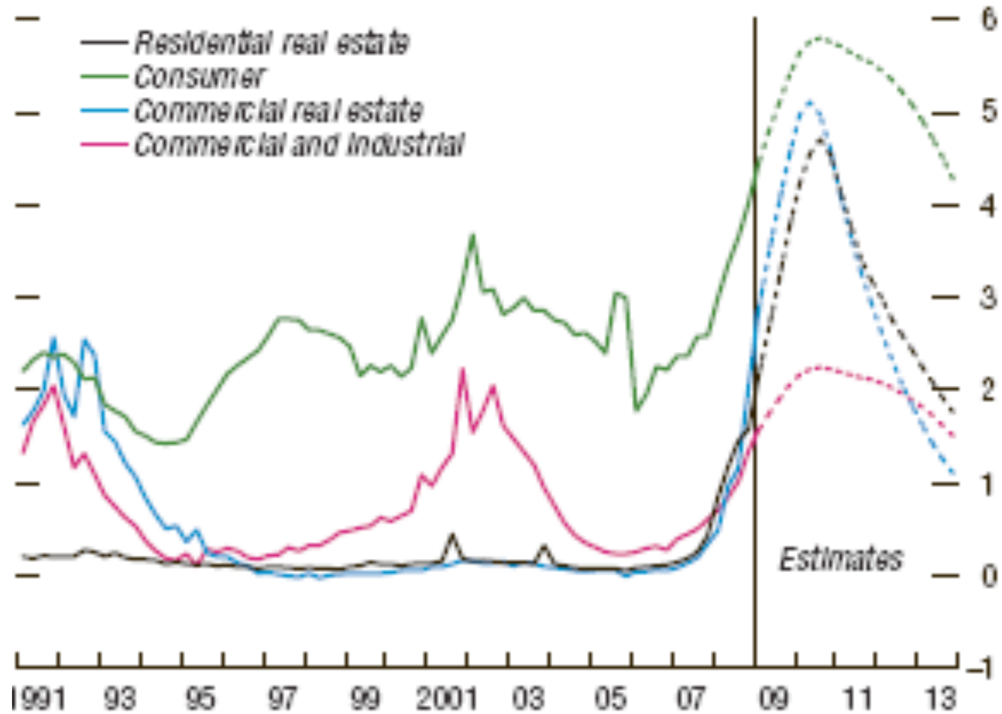
Figure 1.21. Delinquency Rate of U.S. Residential Mortgage Loans
(In percent of total loans, 90+ days)



Source: Bloomberg L.P.

Figure 1.20. U.S. Loan Charge-Off Rates: Baseline
(In percent)



Sources: Federal Reserve; and IMF staff estimates.

Source: IMF Global Financial Stability Report, April 2009

Global MBS issuance and U.S. home prices

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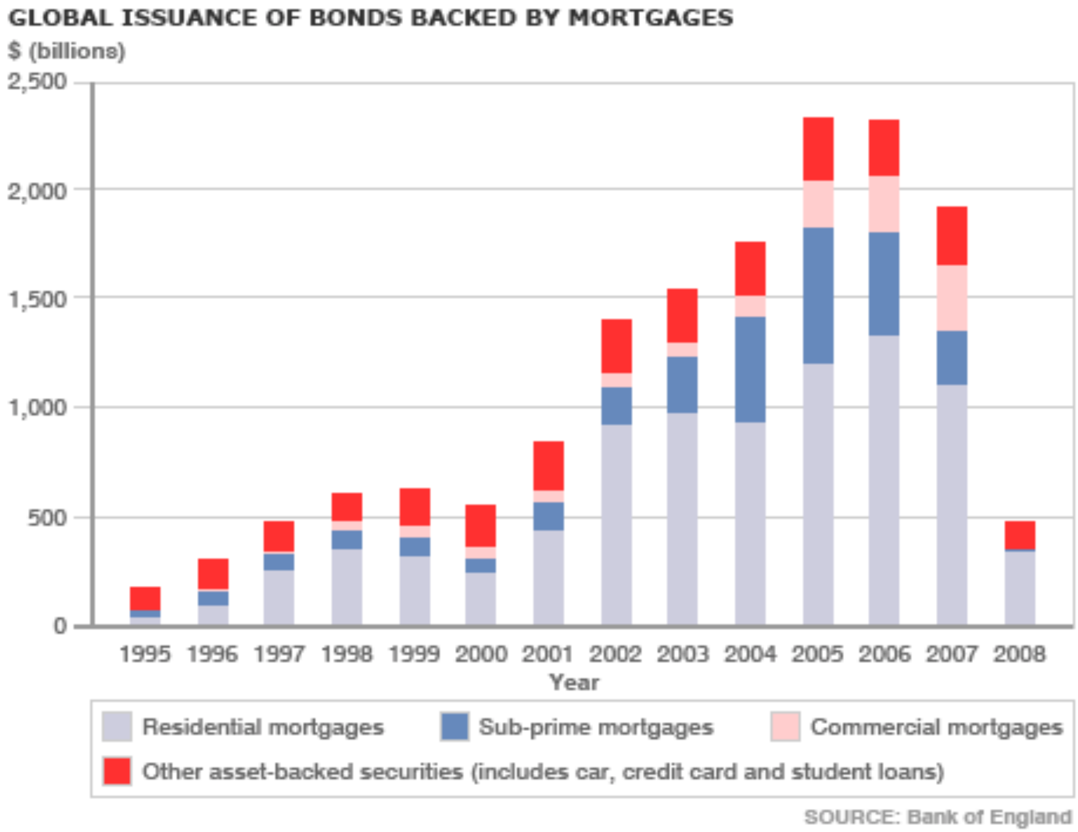

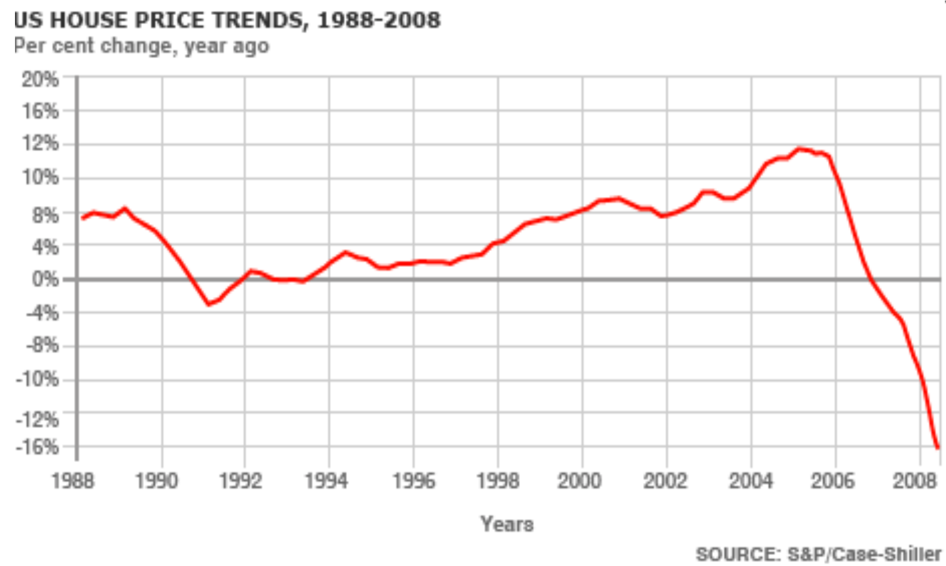

Source: BBC News

Broad bank leverage globally

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United States	E/A	Europe	E/A	Asia Pacific	E/A
New York Community Bancorp	13.8%	Sberbank	12.7%	ICICI Bank Ltd.	11.6%
National City Corp.	11.7%	Banca Monte dei Paschi di Siena S.p.A.	6.7%	Samba Financial Group	9.8%
Huntington Bancshares Inc.	10.5%	Banco Santander S.A.	5.8%	Bank Central Asia	9.4%
Sovereign Bancorp Inc.	10.1%	Unicredito Italiano Spa Ord	5.3%	United Overseas Bank Ltd.	8.7%
Marshall & Ilsley Corp.	10.1%	Allied Irish Banks PLC	5.2%	BOC Hong Kong (Holdings) Ltd.	8.4%
M&T Bank Corp.	9.9%	Standard Chartered PLC	5.1%	Oversea-Chinese Banking Corp. Ltd.	8.4%
SunTrust Banks Inc.	9.8%	HSBC Holdings PLC	5.0%	China Citic Bank Corp. Ltd.	8.3%
State Street Corp.	9.6%	Banco Bilbao Vizcaya Argentaria S.A.	5.0%	DBS Group Holdings Ltd.	8.1%
Hudson City Bancorp Inc.	9.6%	Erste Group Bank AG	4.2%	HDFC Bank Ltd.	7.7%
BB&T Corp.	9.4%	KBC Group N.V.	4.1%	Hang Seng Bank Ltd.	7.4%
Zions Bancorp	9.2%	Nordea Bank AB	4.0%	Malayan Banking Bhd	7.2%
Fifth Third Bancorp	8.4%	Svenska Handelsbanken A	3.7%	Bank of China Ltd.	6.7%
U.S. Bancorp	8.2%	Societe Generale S.A.	3.3%	China Construction Bank Corp.	6.4%
Bank of America Corp.	8.1%	Royal Bank of Scotland Group Plc	3.2%	State Bank of India	6.0%
Wachovia Corp.	8.0%	Danske Bank A/S	3.0%	Industrial & Commercial Bank of China Ltd.	5.9%
KeyCorp	7.9%	Credit Suisse Group AG	3.0%	Bank of Communications Co. Ltd.	5.7%
Wells Fargo & Co.	7.9%	Lloyds TSB Group PLC / HBOS PLC	3.0%	China Merchants Bank Co. Ltd.	5.6%
UnionBanCal Corp.	7.8%	BNP Paribas S.A.	2.8%	Australia & New Zealand Banking Group Ltd.	5.3%
Comerica Inc.	7.7%	Credit Agricole S.A.	2.5%	Commonwealth Bank of Australia	5.3%
Washington Mutual	7.3%	Commerzbank AG	2.3%	China Minsheng Banking Corp. Ltd.	5.1%
JPMorgan Chase & Co.	7.2%	UBS Ag	2.1%	Westpac Banking Corp.	4.3%
Ameriprise Financial Inc.	7.0%	ING Groep N.V.	2.0%	Mitsubishi UFJ Financial Group Inc.	4.1%
Northern Trust Corp.	6.6%	Barclays PLC	1.6%	Sumitomo Mitsui Financial Group Inc.	3.2%
Citigroup Inc.	5.2%	Deutsche Bank AG	1.6%	Mizuho Financial Group Inc.	2.5%
Average	**8.8%**	**Average**	**4.0%**	**Average**	**6.7%**

Regulatory rules and financial technology facilitated leverage globally

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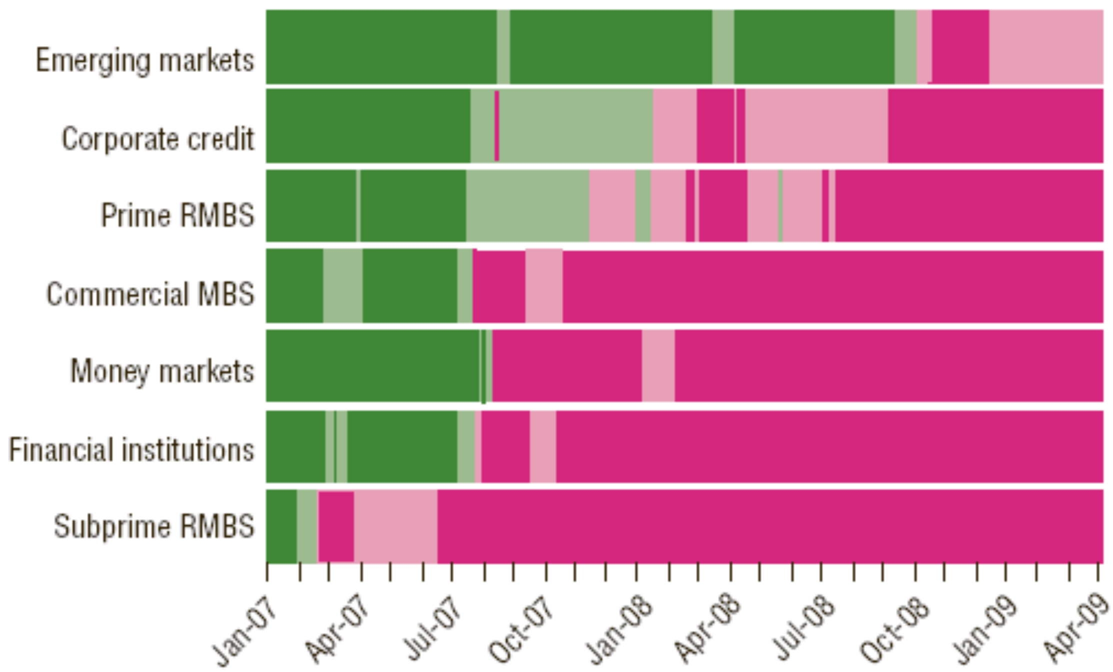
Multi-reference structured credit products like CDO's made it easy for investors to put on a huge amount of leverage

Basel 2 rules only require banks to put aside 0.56% regulatory capital for AAA securities… implies leverage of almost 200x.

$2.3 tril in "AAA" guarantees supported by six monoline insurers with less than $20 bil in equity (0.8%). **Source: Pershing Square Capital Management. "How to Save the Bond Insurers," 11/07**

Market volatilities illustrate the contageon effect of the subprime crisis

Figure 1.2. Heat Map: Developments in Systemic Asset Classes



Source: IMF staff estimates.

Note: The heat map measures both the level and one-month volatility of the spreads, prices, and total returns of each asset class relative to the average during 2004–06 (i.e., wider spreads, lower prices and total returns, and higher volatility). That deviation is expressed in terms of standard deviations. Dark green signifies a standard deviation under 1, light green signifies 1 to 4 standard deviations, light magenta signifies 4 to 7 standard deviations, and dark magenta signifies greater than 7 standard deviations. MBS = mortgage-backed security; RMBS = residential mortgage-backed security.

Source: IMF Global Financial Stability Report, April 2009

Agenda

Brief History and Macro View

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Looking Ahead

Subprime Lessons

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The credit crisis represented a systemic risk management failure

- As of May '09, over $1.3tn credit losses since '07; up to $4.1tn potential loss estimated by IMF
- Commonly cited systemic reasons include excess leverage, illiquidity, contagion
- Failure of credit rating agencies, and too much reliance on ratings
- Failures in risk measurement and monitoring, concentration analysis, stress testing
- Major organizational and cultural issues

Was the U.S. Subprime incident a "Black Swan," an unforecastable extreme tail event?

- In fact, many analysts (including RiskMetrics CFRA) gave early warnings about the US housing bubble burst, and a number of firms positioned themselves to profit from this risk

Robert Shiller: "There was a failure to communicate and a failure to put all this information together and act on it in a systematic way" Source: Portfolio.com, "World According to Robert Shiller," by Lloyd Grove

A Partial Subprime Time Line 2007

22-Feb	**HSBC fires head of its US mortgage lending business as losses reach $10.5bn.**
12-Mar	**Shares in New Century Financial suspended amid fears it might be heading for bankruptcy.**
20-Jun	**Merrill Lynch attempts to get bids on $800 million of mortgage securities seized from Bear Stearns Credit Enhanced Fund**
9-Aug	**Short-term credit markets freeze up after BNP Paribas suspends 3 investment funds worth 2bn EUR due to US sub-prime**
9-Aug	**ECB pumps 95bn euros into the eurozone banking system.**
4-Sep	**Bank of China reveals $9bn in sub-prime losses**
13-Sep	**Northern Rock asked for was granted emergency financial support from the Bank of England,**
20-Sep	**Goldman Sachs makes a profit by betting that mortgage-backed securities will fall despite $1.5bn exposure.**
1-Oct	**UBS revealed losses of $3.4bn in fixed income & MBS business, while Citigroup admits $.31bn in losses.**
5-Oct	**Merrill Lynch reveals $5.6bn sub-prime loss**
15-Oct	**Citigroup writes down $5.9bn on exposure to the US sub-prime market.**
30-Oct	**Merrill Lynch takes a $7.9bn hit following exposure to bad debt. Its chief executive, Stan O'Neal, resigns.**
5-Nov	**Citigroup announces fresh subprime losses between $8bn and $11bn. CEO Charles Prince resigns.**
8-Nov	**Morgan Stanley unveiled a $3.7bn loss from its US sub-prime mortgage exposure.**
16-Nov	**Goldman Sachs forecasts sub-prime losses for entire financial sector at $400bn (£200bn).**
10-Dec	**UBS reports a further $10bn write-down caused by bad debts in the US housing market.**
14-Dec	**Citigroup takes $49bn sub-prime debt back on its balance sheet, closing 7 SIVs that relied on money market funding.**
19-Dec	**Morgan Stanley writes off $9.4bn in sub-prime losses and sells a 9.9% stake in the company to CIC**

- Source: BBC News, Bloomberg

Subprime Time Line Continued: 2008

9-Jan	Bear Stearns boss James Cayne steps down after the firm reveals $1.9bn in sub-prime losses, the largest in its history.
15-Jan	Citigroup reports a $9.8bn loss for the fourth quarter and writes down $18bn in sub-prime losses
17-Jan	Merrill Lynch unveils a $14.1bn sub-prime write-downs and posts a net loss of $7.8bn in 2007.
14-Feb	Commerzbank cuts $1.1bn off the value of subprime investments and warns losses could worsen.
14-Feb	UBS confirms it has made a loss of $4bn in 2007 after cutting the value of investments by $18.4bn.
14-Mar	Carlyle Capital fails as the credit crisis spreads from sub-prime related products to other mortgage-backed investments.
14-Mar	Bear Stearns receives emergency funding, after its exposure to mortgage-backed investments undermined confidence
16-Mar	Bear Stearns agrees to be bought by JPMorgan at a huge discount, $2 per share
1-Apr	UBS reveals a further $19bn of asset writedowns. This came on top of the $18.4bn which it announced for 2007.
17-Apr	Merrill Lynch reveals an addtional $4.5bn in credit writedowns and a loss of nearly $2bn in the first quarter of the year.
18-Apr	Citigroup reveals another $12bn in sub-prime losses, bringing its total to $40bn. It cuts 9000 jobs amid $5bn quarterly loss
22-Apr	RBS reveals £5.9bn in writedowns from the credit crunch, and asks its shareholders for an additional £12bn
15-May	Barclays takes a further £1bn writedown on assets.
12-May	HSBC reveals a further $3.2bn of losses linked to the US sub-prime market.
13-Jul	IndyMac bank seized by federal regulators, who say it is the second-largest bank failure in U.S. history
14-Jul	Fannie Mae & Freddie Mac shares plunge below $10 as Paulson seeks Congress's approval for a rescue package
31-Jul	UK house prices show their biggest annual fall since the Nationwide began its housing survey in 1991, a decline of 8.1%
4-Aug	HSBC announces $3.7bn in fresh credit writedowns
7-Aug	AIG earnings and shares plunge on writedowns ($6.08bn hit on residential MBS plus $5.56bn from sold bond insurance)
12-Aug	UBS has said it will reorganise itself into three units, after announcing an additional $5.1bn sub-prime write downs

- Source: BBC News, Bloomberg

Importance of Enterprise Risk Management

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Firms with strong enterprise risk management cultures excelled, while organizations where risk is managed in silos failed

The industry is recognising that firms that have skirted subprime disaster owe their success in part to robust risk management programmes. Among the regulators' conclusions are that firms with a comprehensive approach to risk management, where assessment of the exposure to risk is integrated throughout the organisation and where there is effective sharing of information, have dealt more successfully with the credit crunch and disappearing liquidity. Source: FT.com, All minds focus on the urgent issue of risk, Beagan Wilcox

Risk managers need to be perceived like good goalkeepers: always in the game and occasionally absolutely at the heart of it, like in a penalty shoot-out. Source: Economist.com, Confessions of a Risk Manager

The Senior Supervisors Group (SSG) Report

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Released 6 March 2008, a joint report of regulators from entities in France, Germany, Switzerland, United Kingdom and United States

- Result of conversations with sixteen internationally active banks

Firms that avoided such problems demonstrated a ***comprehensive approach to viewing firm-wide exposures and risk, sharing quantitative and qualitative information*** *more effectively across the firm and engaging in more effective dialogue across the management team*

Four Firm-Wide Risk Management Practices That Differentiated Performance

1. *Effective* ***firm-wide risk identification and analysis***
2. *Consistent application of independent and rigorous* ***valuation*** *practices across the firm*
3. *Effective management of* ***funding liquidity****, capital, and the balance sheet*
4. *Informative and* ***responsive risk measurement*** *and management reporting and practices***.**

http://www.newyorkfed.org/newsevents/news/banking/2008/rp080306.html

Lack Of Transparency Through Semantics And Omission - New Century Financial (NEW)

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Revised Allowance Presentation Obfuscated Loan Loss Reserve and Charge-offs

From NEW's 6/06 earnings release:

At June 30, 2006, the balance of the mortgage loan portfolio was $16.0 billion. The allowance for losses on loans held for investment was $209.9 million, representing 1.31 percent of the unpaid principal balance of the portfolio. This compares with 0.79 percent

From NEW's 9/06 earnings release:

At September 30, 2006, the allowance for losses on mortgage loans held for investment and real estate owned was $239.4 million compared with $236.5 million at June 30, 2006. These amounts represent 1.68 percent and 1.47 percent of the unpaid principal

Disaggregating these reserves, REO increased to $48m from $27m, while LLR fell to $192m from $239m

CFRA Report:

Table 1: Increases in the REO Valuation Allowance May Have Masked a Decline in the Loan Loss Allowance

	Allowances	
	As Reported*	LLR Only
Beginning Balance	$ 236,498	$ 209,889
Additions	$ 20,756	$ 20,756
Charge-Offs	$ (17,876)	$ (39,067)
Ending Balance	$ 239,378	$ 191,578

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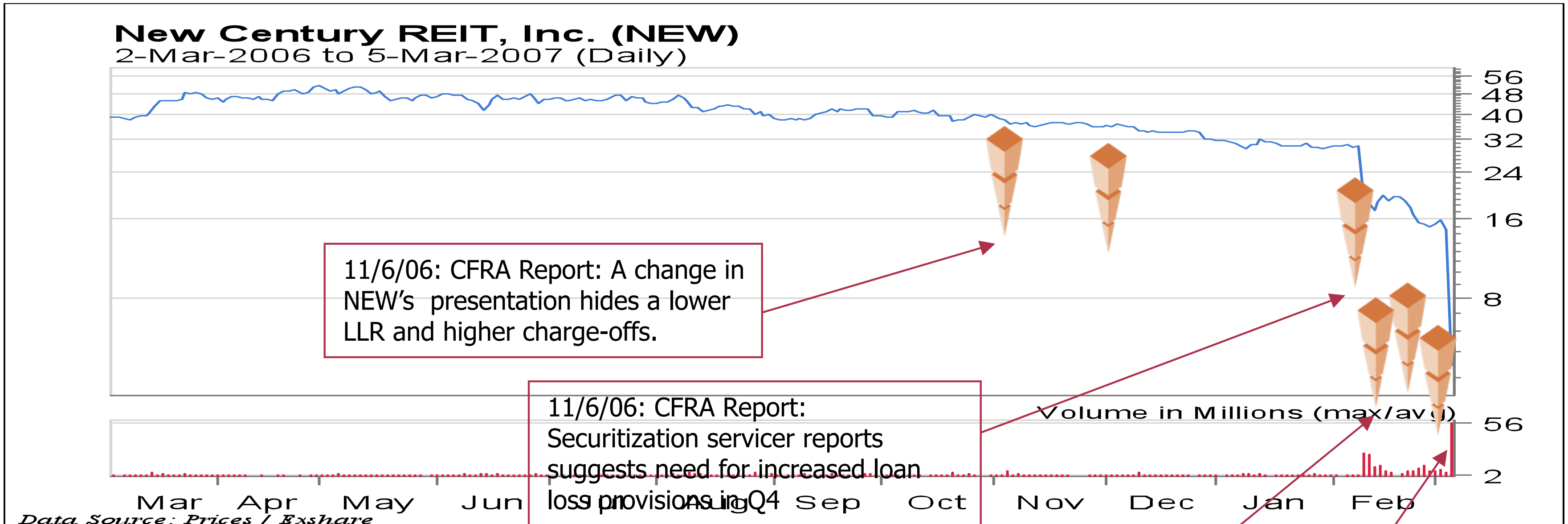

11/6/06: CFRA Report: A change in NEW's presentation hides a lower LLR and higher charge-offs.

11/6/06: CFRA Report: Securitization servicer reports suggests need for increased loan loss provisions in Q4

11/7/06: NEW announces earnings restatement, Q4 loss, reduced liquidity

11/7/06: NEW announces NYSE trading review, criminal inquiry and potential going concern doubt from KPMG

Bear Stearns High Grade Structured Credit Strategies Fund

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Bear Stearn's High Grade Structured Credit Strategies Fund, managed by Ralph Cioffi imploded in May 2007, wiping out investors' capital (over $1.7bn)

- Investors up 46.8% from Oct '03 to Mar '07 w/ 30+ months of consecutive positive returns. Strategy was to buy high grade subprime CDO tranches, and use leverage of up to 20x to extract returns from positive carry (Short ABX "hedge" put on late 2006 resulted in the fund's first loss when ABX rallied in March after a sharp drop in Feb).
- Rating Agencies assigned high ratings due to low historical defaults (… in a rising US housing market!)
- Warning signs – extremely high autocorrelation of returns (Box-Ljung test $p=10^{-15}$) point to illiquidity and potential valuation issues.

<u>HFR Database Returns Analysis of 165 fixed income funds with data from October 2003 through February 2007</u>

- 25th percentile p-value 41%
- 50th percentile p-value 9%
- 75th percentile p-value 0.8%

Outliers … five funds with p-values smaller than 10-7:

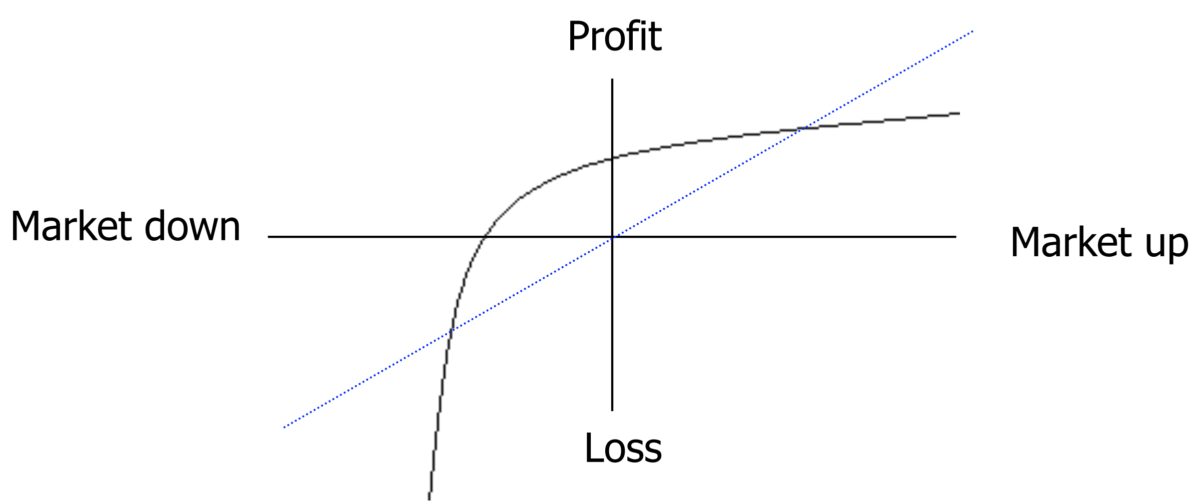
- Bear Stearns High-Grade Structured Credit (10-15) closed in June
- Galena Street (10-7) closed in July

Source: Chris Finger, "A Subprimer on Risk," August '07 RiskMetrics Research Monthly

Lessons for Investors in Bear's Funds

1. **Realized HF returns are NOT a good measure of risk. Need to understand what's generating return. In fact, persistent positive returns with high autocorrelation are a warning sign**
2. **Demand full risk transparency and understand what's true alpha and what's alternative beta (e.g., carry generated through credit, term, fx, vol, etc.)**
3. **Avoid Illiquid Assets + Leverage + Short Gamma (or accelerating losses)**

Short Gamma vs Linear position



Leveraged Credit Strategies & Contagion

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Levered L/S credit strategies got crushed with contagion… short gamma

- Morgan Stanley: $2bn short subprime, $14bn long AAA subprime paper
- Peleton Partners: $2bn ABS fund held $17bn AAA prime, short $6bn BB & lower subprime paper

Pure leveraged short subprime bets performed extremely well… long gamma

- Limited downside, huge upside potential: e.g., a 10x leveraged subprime strategy might have a 20% annual downside (10x200bps) but a 1000% upside
- Winners included funds that entered short subprime positions in 2006 Paulson, Corriente, Lahde, Hayman…

"We were saying that there were going to be $1 trillion in loans in trouble," Bass says. ``That had really never happened before. You had to have an imagination to believe us….

"Interesting presentation," Bass says the firm's chief risk officer said into his ear, his arm draped across Bass's shoulders. ``God, I hope you're wrong." – Kyle Bass, Hayman Capital on Bloomberg News

While some banks put on subprime hedges to limit their losses, banks are structurally leveraged long credit. Basel 2 rules only require banks to put aside 0.56% regulatory capital for AAA securities.

AIG Financial Products – the ultimate systemic short gamma machine

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Financial Products Division was a huge seller of credit insurance to banks globally, which is equivalent to selling systemic crash puts

- $527bn credit insurance (on MBS and corporates), of which Fed took over $62bn in 2008.
- Not marked to market, but rather accounted as accrual income
- When the credit markets deteriorated, collateral calls overwhelmed the company

Securities Lending division sought extra yield by investing cash in supersenior AAA subprime backed CDO’s

$99.3bn loss for 2008, including Q4 loss of $61.7bn, biggest quarterly loss in history

$180bn of U.S. government bailout as of March 2009.

UBS's Leveraged Credit Strategy

UBS's strategy was to lever only highly rated investments

- Risk aversion from LTCM losses resulted in very stringent risk management guidelines with comfort for only very highly rated credit risk, which were then highly geared to generate returns

But hedges were incomplete… and risk managers ignored short gamma

- *If the bank's business leaders overlooked risk, its risk controllers miscalculated it. Confidence in the AAA ratings on CDOs explains the decision to hedge only 2-4% of many super-senior exposures.* Source: Economist.com, Wealth mismanagement, Apr 24th 2008

A small US desk generated 2/3 of 2007 losses

- *The CDO desk concentrated on riskier "mezzanine" CDOs, which generated higher fees but suffered heavier falls in value when markets seized up in August. Cheaper hedging strategies based on buying protection on just a tiny proportion of the bank's "super senior" (least risky) positions tended to win out over more effective but pricier ones, such as insuring the lot. The end result: a desk that numbered just 35-40 people at its peak was responsible for write-downs of around $12 billion in 2007, two-thirds of the total. The other main source of write-downs is almost as staggering: it comprised asset-backed securities bought as part of the bank's liquidity reserve.* Source: Economist.com, Wealth mismanagement, Apr 24th 2008

Merrill's Missed Opportunity For Risk Management

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June 20, 2007, ML's credit risk department attempts sale of $800mm of Bear Stearns' subprime CDO's

- Instead of trying to dump these CDOs on the market, ML should have realized that it has tens of billions more of the same structures on its own books (it had sold them to Bear in the first place)

Merrill's silos & Stan O'Neal

Risk was not integrated but split between a credit risk officer and a market risk officer, both of whom reported to the CFO, who then reported to the CEO…Contradicting then-CEO Stan O'Neal was a dangerous game. "Either you did what he wanted or you were out;' says a Merrill employee. - Source: CFO.com, "Missing Pieces" by Avital Louria Hahn, March 2008

Thain clearly believes that his predecessor emphasized the wrong Goldman virtues. Sure, Goldman engages in high-stakes bets, but it is organized in a way that places maximum emphasis on risk management. O'Neal left out that part. So Thain's Goldmanizing of Merrill has a different flavor: He is removing the silos of the past, dismantling hierarchies and cliques that kept departments isolated from one another. His revamping of the compensation system is also in the Goldman way, a sharp departure from O'Neal's "every man for himself" pay structure. - Source: Portfolio.com, The Taming of Merrill Lynch by Gary Weiss, May 2008

Firms that focused on short term revenues without proper risk management were hurt the most

RiskMetrics Group

The dark side of Producer Worship

Sidelining caution in favor of potential profit is not particularly difficult in a culture built on producer worship. Traders looking for capital often get their business-unit head to intervene on their behalf - Source: CFO.com, "Missing Pieces" by Avital Louria Hahn, March 2008

Risk Managers need to be willing, able and empowered with authority to say no

Some risk officers admit that a year ago - or when the credit bubble was in full swing - it was often difficult for them to exert any restraining influence over their colleagues in the trading or structuring teams, even when they could spot potential dangers, because structured finance teams were making such high profits. "We knew that we could perhaps turn down two or three deals a month, so they would take care to only pick the most egregious ones," says one senior risk officer. "If you tried to clamp down on more, you risked being fired or sidelined." Source: FT.com, RISK MANAGEMENT 2008, By Gillian Tett, Apr 28, 2008

Risk Management needs to start at the top

Senior managements and the boards of directors of major financial institutions such as Citicorp (C) and Merrill Lynch (MER) failed to perform their proper corporate governance roles, helping to precipitate the financial markets crisis of recent weeks, says Henry Kaufman, president of Henry Kaufman & Co. - Source: Businessweek.com, What Went Wrong at Citi and Merrill, by William J. Holstein, Jan 2008

Richard Fuld's Lehman illustrates the dangers of autocratic leadership and GroupThink

RiskMetrics Group

Fuld's autocratic leadership squashed dissenting viewpoints and discussions

Fuld was known around the office as ``the Gorilla.'' His icy stare, people who worked at Lehman say, froze recipients with fear. ***No one wanted to tell Fuld something was wrong or to question how Lehman was run…Fuld pushed potential rivals aside****… The man Fuld finally appointed chief operating officer was Gregory, a trusted lieutenant who had worked at Lehman since 1974. He would make it his mission to keep Fuld's life uncomplicated by debate. Any meeting with Gregory… was a soliloquy. The COO delivered lectures on matters as minute as improving the look of sloppy dressers. Management-committee meetings were conducted without discussion...The same was true of executive-committee meetings presided over by Fuld. While reviewing budgets for 2007, one committee member questioned the performance of a unit, according to a person who was in the room. Fuld stared at him coldly, then broke the silence:* ***``You've got some balls to say that, knowing how much I hate that topic.''*** *As Fuld returned to studying the papers in front of him,* ***Gregory continued dressing down the committee member for his impertinence****. He also upbraided him after the meeting, demanding that any objections be brought to Gregory privately and not voiced in front of the committee.*

Source: Bloomberg, Onaran & Helyar," Fuld Sought Buffett Offer He Refused as Lehman Sank"

JPMorgan: not too big and complex to manage

RiskMetrics Group

JPM's conservative risk based approach yielded slower profit growth before the bust

CEO Jamie Dimon: "We'd get the quarterly reports from our competitors and see that they'd added $100 billion to their balance sheets… And they were hardly adding any capital, so it looked like their investments were almost risk-free." J.P. Morgan…sank from third to sixth in fixed-income underwriting from 2005 to 2007, and the main reason was its refusal to play in subprime CDOs.

JPM used information from both retail and investment bank to exit subprime in Oct 2006

- In their Oct 2007 retail bank discussion, JPM spotted major increases in subprime delinquencies on their own books, and delinquencies of 300% bigger at competitors
- Cost of CDS protection on AAA subprime CDOs increased in late 2006, and investment banking co-head Bill Winters concluded "We saw no profit, and lots of risk, in holding subprime paper on our balance sheet,"

No Group Think at JPM… strong but not autocratic leadership

These players [JPM's management team] take their cue from the outspoken - frequently outrageous – coach [Dimon]. The group is generally loud and unsubtle. At the monthly all-day operating-committee meeting of the top 15 executives, the atmosphere is variously described by the participants as "Italian family dinners" or "the Roman forum - all that's missing is the togas." Dimon will throw out a comment like "Who had that dumb idea?" and be greeted with a chorus of "That was your dumb idea, Jamie!" "At my first meeting, I was shocked," says Bill Daley, 60, the head of corporate responsibility and a former Secretary of Commerce. "People were challenging Jamie, debating him, telling him he was wrong…". Dimon stakes out strong positions - but he's no dictator. He will also listen, and surprisingly, he'll even change fervently held opinions when a team member presents an argument that's sufficiently convincing

Source: Shawn Tully, Fortune.com, "**Jamie Dimon's swat team**" September 2008

The U.S. Savings and Loan Crisis: a brief review

S&L crisis started when interest rates increased in the late ’70s

- ALM mismatch: short term deposit funding with fixed mortgages

Regulators propped up S&L’s by loosening capital and accounting requirements and raising deposit insurance in early ’80s

- S&L’s invested new funds in higher yielding (and riskier) commercial real estate and construction projects. After a small respite from falling rates in ’83-’84, these investments soured as oil, property and farming sectors collapsed in mid ’80s…
- From ’86 regulators unsuccessfully attempt to keep the industry afloat through consolidations

1989: congress passes FIRREA

- Financial Institutions Reform, Recovery and Enforcement Act of 1989 establishes Resolution Trust Corporation to liquidate insolvent S&L’s at an estimated cost to taxpayers of $30-50bn.
- Over 600 S&L’s closed from ’89 to ’95… total cost to taxpayers: $153bn

Source: www.erisk.com/Learning/CaseStudies/USSavingsLoanCrisis.asp

S&L vs Subprime: a comparison

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Similarities

- Market volatility affecting a "crowded trade" triggered massive systemic risk
- Industry wide failure in risk assessment and risk management
- Management focus on short term profits without proper regard for risk (short gamma)
- "Socialization of losses, privatization of gains" ("capitalism for the poor, socialism for the rich").
- Calls for greater financial industry regulation and oversight ("Maybe greed is not good enough")

Contrast

- We're in the midst of a global crisis & contagion into all asset classes
- Faster pace: $1.3tn losses in 2yrs vs. slow motion S&L wreck of almost 2 decades
- Global financial institutions took the first hit first, smaller ones to follow

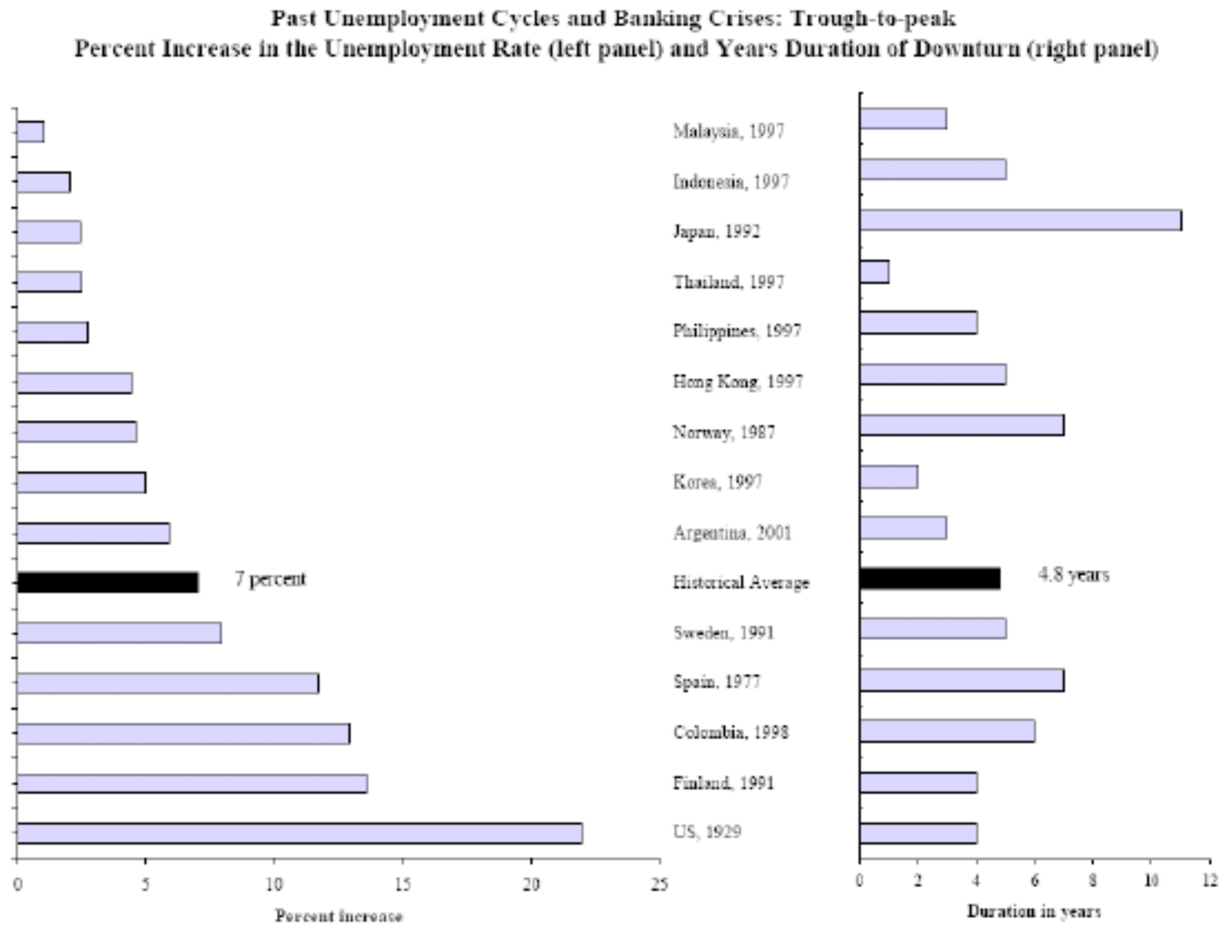
Agenda

Brief History and Macro View

Subprime Case Studies

Looking Ahead

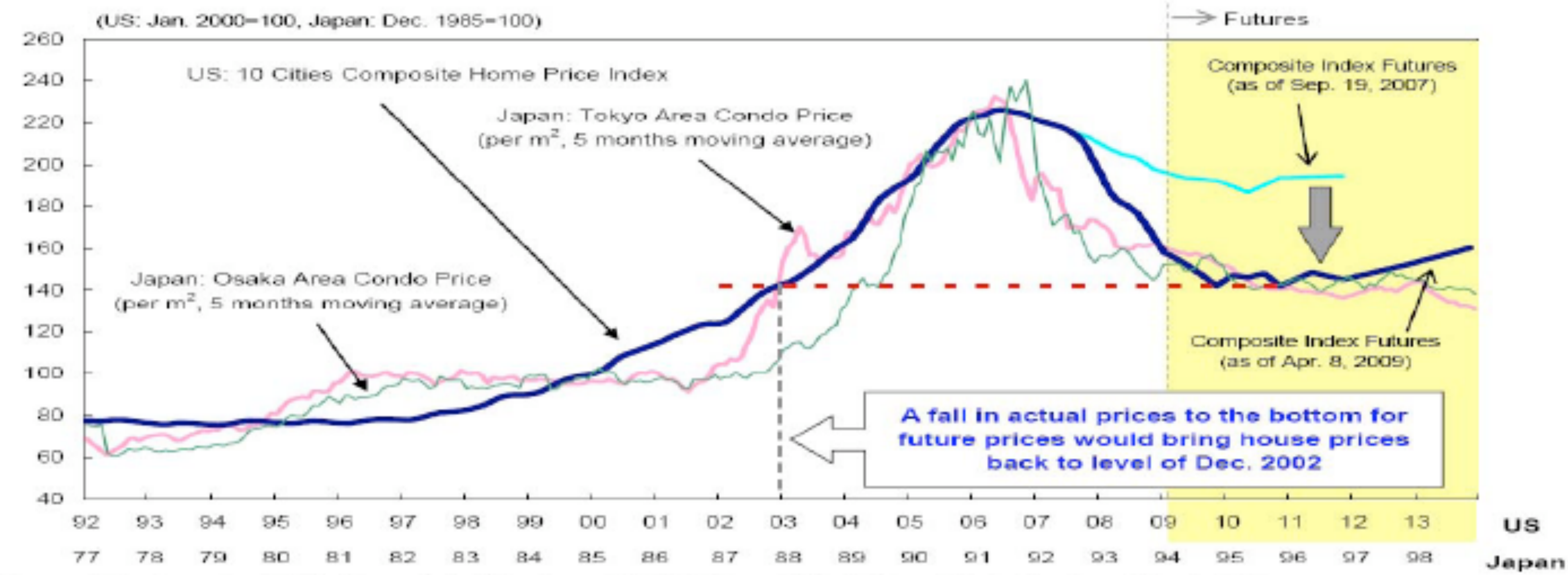
History of Banking Crises and Employment Cycles, Reinhart and Rogoff (2008) suggests a slow recovery



Sources: OECD, IMF, Historical Statistics of the United States (HSOUS), various country sources, and authors' calculations.
Notes: Each banking crisis episode is identified by country and the beginning year of the crisis. Only major (systemic) banking crises episodes are included, subject to data limitations. The historical average reported does not include ongoing crises episodes.

Source: The Rohatyn Group, Emerging Markets In the Global Crisis *A Medium Term Outlook , May 2009*

Parallels with Japan suggest an even more protracted recovery

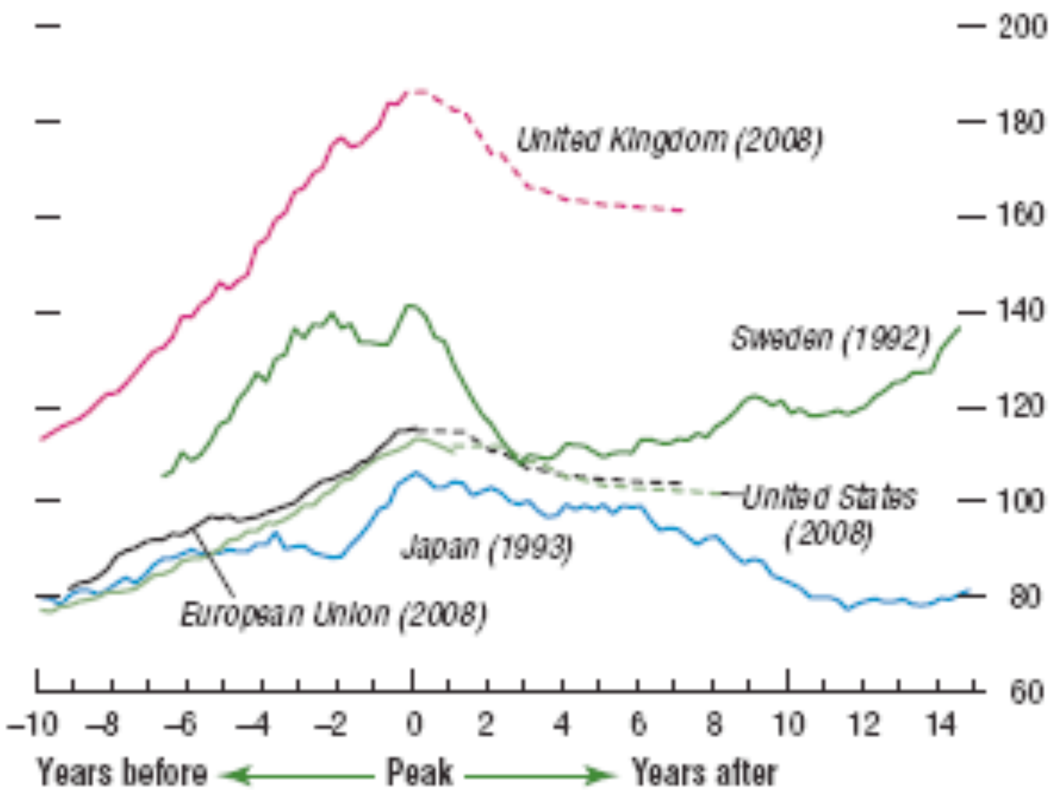


Sources: Bloomberg, Real Estate Economic Institute, Japan, S&P "S&P/Case-Shiller® Home Price Indices", as of Apr. 8, 2009.

Source: The Rohatyn Group, Emerging Markets In the Global Crisis *A Medium Term Outlook , May 2009*

Historical view of peak credit lending & recovery

Figure 1.4. Bank Credit to the Private Sector
(In percent of nominal GDP)



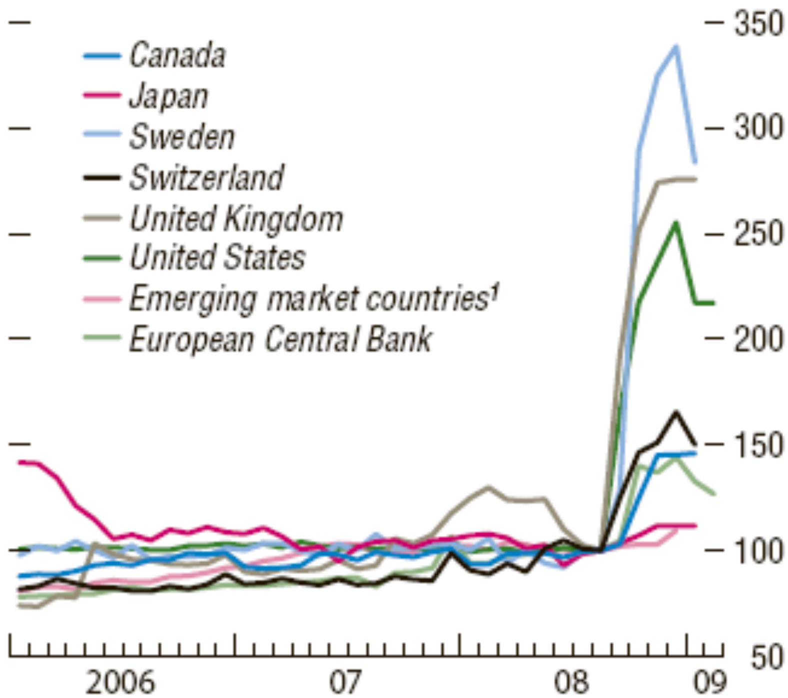
Sources: National authorities; and IMF staff estimates.
Note: Dashed lines are estimates. Year of credit peak in parentheses.

Source: IMF Global Financial Stability Report, April 2009

Enormous expansion of central bank balance sheet

RiskMetrics Group

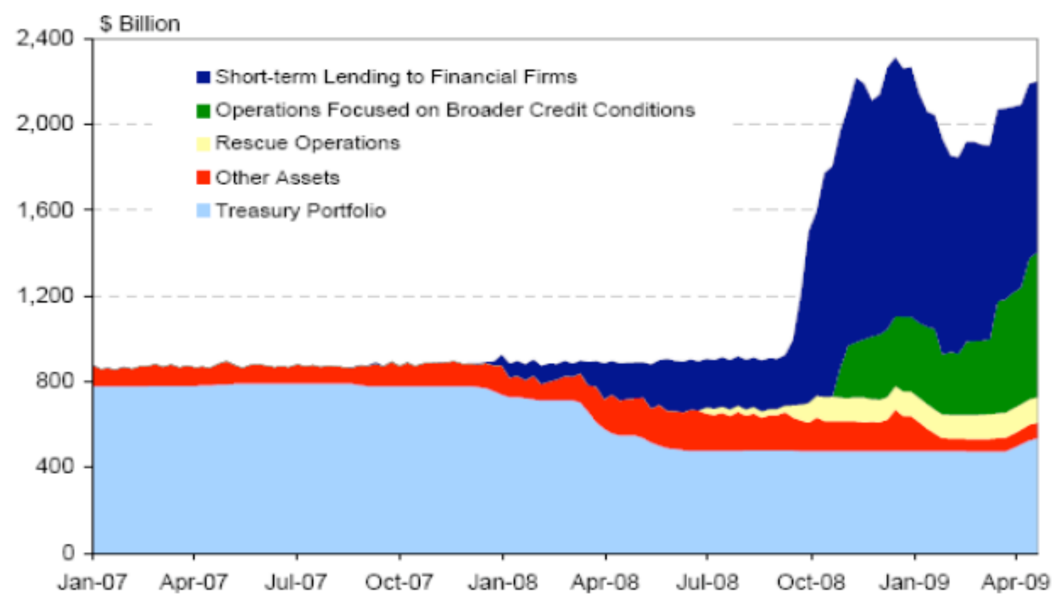
Real Central Bank Assets of Selected Countries,January 2006-Latest
(August 2008 = 100)



Source: IMF, International Financial Statistics database.
[1]Median for 27 medium-size and large emerging market countries.

Source: IMF Global Financial Stability Report, April 2009

Figure 10. Federal Reserve Balance Sheet



Source: Macroeconomic Advisors.

Source: The Rohatyn Group, Emerging Markets In the Global Crisis *A Medium Term Outlook , May 2009*

Broad government credit support

RiskMetrics Group

Table 1.7. Bank Wholesale Financing and Public Funding Support

(In billions of U.S. dollars)

	Wholesale Funding in 2008:Q2	Central Bank Liquidity (Crisis Balance Sheet Growth)	Government Asset Purchases Commitment	Government Guarantee Commitment
United States				
Money market	1,908	980	1,850	1,830
Longer term	2,908			
Euro Area				
Money market	12,015	820	225	1,400
Longer term	8,877			
United Kingdom				
Money market	3,869	150	450	1,250
Longer term	1,349			
Total	**30,926**	**1,950**	**2,525**	**4,480**

Sources: Bankscope; national central banks; and IMF staff estimates.

Note: Guarantees only includes those with announced limits (not open-ended guarantees) and U.K. and U.S. guarantees of Bank of America, Citigroup, Lloyds, and RBS.

Source: IMF Global Financial Stability Report, April 2009

Significant public debt and stabilization costs

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Table 1.8. Public Debt and Stabilization Costs
(In percent of GDP)

	Gross Government Debt			
	2008	2010	2008–10 *(Percent change)*	Financial Stabilization Costs[1]
Canada	64	77	20.3	4.4
France	67	80	19.4	1.8
Germany	67	87	29.9	3.1
Italy	106	121	14.2	0.9
Japan	196	227	15.8	1.7
United Kingdom	52	73	40.4	9.1
United States	71	98	38.0	12.7

Sources: Debt-to-GDP estimates are from the IMF, *World Economic Outlook*, April 2009. Financial stabilization costs are estimates by the IMF Fiscal Affairs Department in "Companion Paper—The State of Public Finances: Outlook and Medium-Term Policies after the 2008 Crisis," March 6, 2009 (IMF, 2009a).

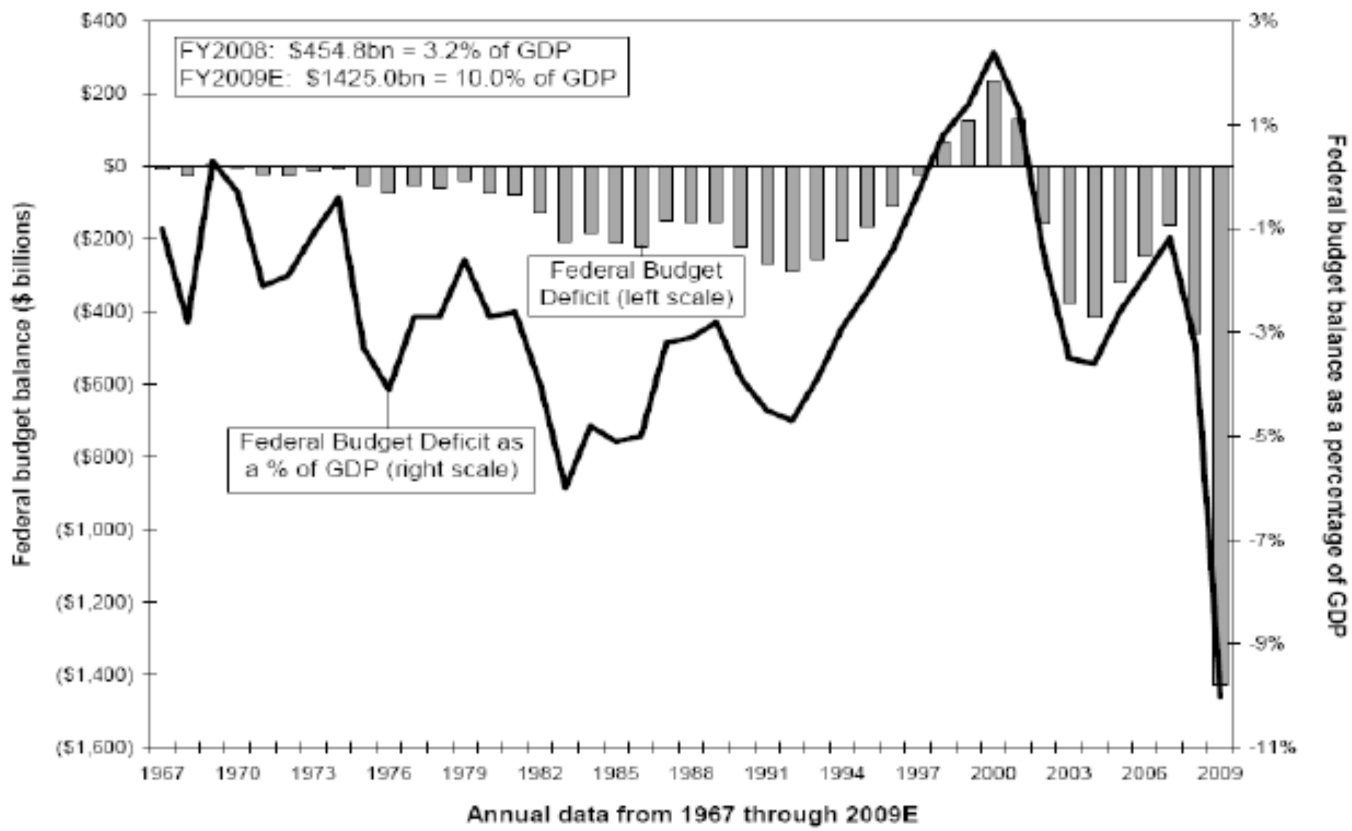
[1]Based on support measures announced through mid-February. This is the net cost, which is gross support minus recovery over the next five years. The recovery rates differ by type of support, with higher recovery expected from guarantees and central bank liquidity support than from direct support.

Source: IMF Global Financial Stability Report, April 2009

Major deterioration in U.S. Fiscal position

RiskMetrics Group

Figure 9. US Federal Budget Deficits 1967-2009E



Source: US Department of the Treasury, Goldman Sachs Portfolio Strategy.

Source: The Rohatyn Group, Emerging Markets In the Global Crisis *A Medium Term Outlook , May 2009*

Emerging versus developed markets, challenges and risks

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	Developed Markets	Emerging Markets		
		Asia	Latam	EMEA
Problem	Over leveraged consumer insolvent banks	Low exports, limited credit	Low exports, low commodities, limited credit	Low exports + liquidity+ Solvency
Policy responses	Low rates, liquidity injections fiscal stimulus	Low rates, gov spending weak	Low rates, gov spending, weak FX	Low rates, gov spending, weak FX
Way out	Balance sheet repair higher savings, bank recap	Foster dom. demand lower savings	Foster dom. demand, structural reforms	Private debt/bank restructuring IMF bailout
Return to growth >1%	2011	2009	2010	2010
Risks	Relapse of recession, slow bank restructuring	Longer, deeper, global recession Inability to create employment	Longer, deeper, global recession Fiscal deterioration	Longer, deeper, global recession Political instabiity

Source: TRG

Source: The Rohatyn Group (TRG), "Emerging Markets In the Global Crisis," May 2009

Integral Analysis of the Subprime crisis

RiskMetrics Group

Individual

- **Short term return focused**
- **Not open to different views**
- **Poor judgment: too much trust in credit ratings & models**
- **Overconfidence, short memory, trend following**

- **Short term incentives**
- **Low rates & easy credit**
- **Flawed risk models & ratings**
- **Securitization & credit derivatives**
- **Period of low volatility (Hyman Minsky)**
- **Excessive leverage**

Subjective/Interior

Objective/Exterior

- **Weak risk culture**
- **Poor communication**
- **Group Think**
- **Herd mentality**
- **Weak ethics**

- **Asymmetric gov't policy & guarantees**
- **Flawed bank capital standards**
- **Agency vs. Principal conflicts**
- **Systemic impact of financial innovations**
- **Siloed risk management approaches**
- **Poor risk transparency**
- **Weak governance & oversight**

Collective

- **Analysis based on Ken Wilber Integral "AQAL" Framework**

How to minimize future financial bubbles?

RiskMetrics Group

Symmetric and countercyclical government actions

- Target asset bubbles and other excesses
- Countercyclical monetary and fiscal policies

Better collective risk management

- Greater risk transparency and sharing of cross-industry information
- More internal and external risk communication
- Focus on developing pervasive risk management culture