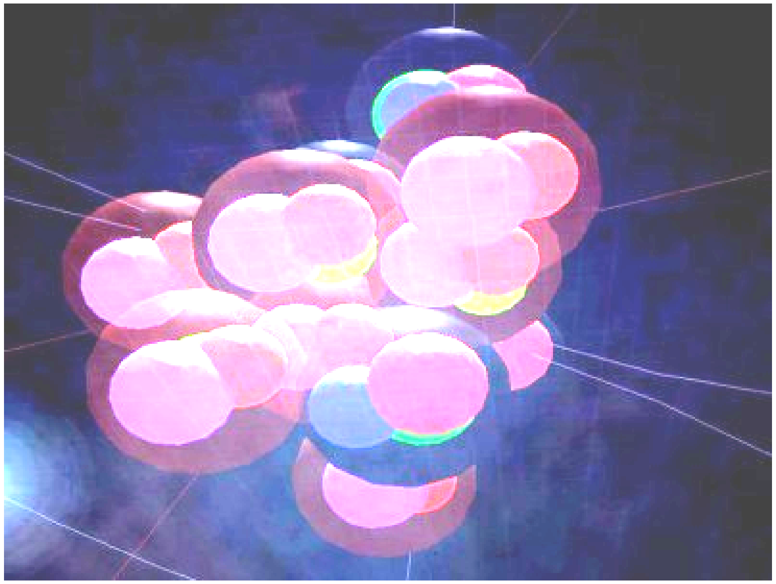


Troubled Assets: Elements of the Mortgage Crisis

Carl Plat

UCSC Economics Talk - October 24, 2008

Topics

“Capitalism in convulsion: Toxic assets head towards public balance sheet”

Financial Times 9/19/08

"We need to keep the toxic twins, Fannie and Freddie, at the center of this hearing," said Shays. "We can't wait till Halloween to unmask these two monsters of corporate finance."

Rep. Chris Shays

Congressional Testimony Oct08

What is a Troubled Asset?

- An asset becomes troubled or toxic when the current value of the asset is below its intrinsic value, the value is expected to deteriorate further in the future, and there is no liquid functioning market available to dispose of the asset.

- Toxic assets can include Mortgage Loans, Mortgage Securities, or Collateralized Debt Obligations (bundles of securities). These are the elements of the current crisis.

Is the Credit Crisis a Bubble?

- Similar to classical bubbles, the current credit crisis includes widespread speculation. In this case, it is real estate speculation.

- Similar to the build and bust structure of classical bubbles, there is exaggerated wealth creation followed by wealth destruction.

Is the Credit Crisis a Bubble?

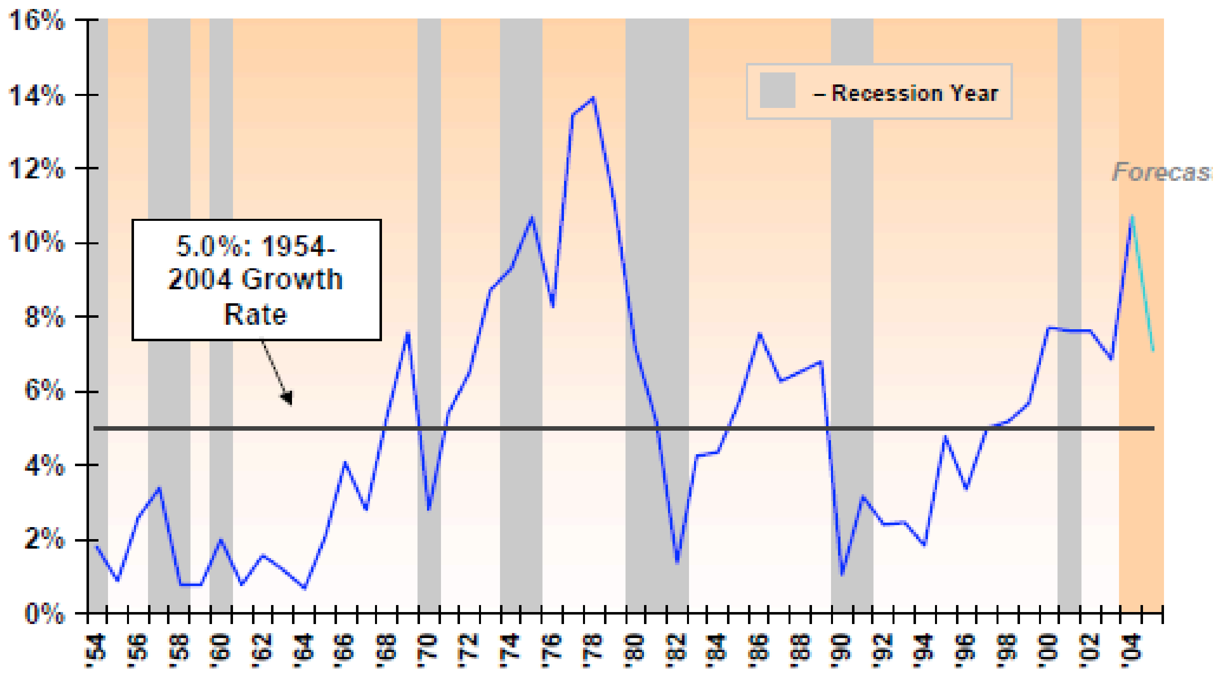
- While large losses have been experienced by investors in the stock markets and by homeowners, the crisis has centered on banks and dealers.

  This is distinctly different from the Dot Com bubble where losses were mainly experienced by investors.

- The current credit crisis includes a Systemic Risk component. Banks are essential to financial system due to their function of providing credit & liquidity to the economy.

Is the Credit Crisis a Bubble?

Figure 2: Annual Growth Rate of Home Prices in the U.S. 1954-2005



Source: U.S. Bureau of Labor Statistics - CPI-Shelter index (1954-1963), U.S. Bureau of the Census - New One-Family Houses Sold series (1963-1970), and Freddie Mac's Conventional Mortgage Home Price Index (1970-2005)

8/08 YoY -5.9%

Mortgage Asset Creation

Homeowner ***Bank*** ***Investor***

Deed → Loan → Security

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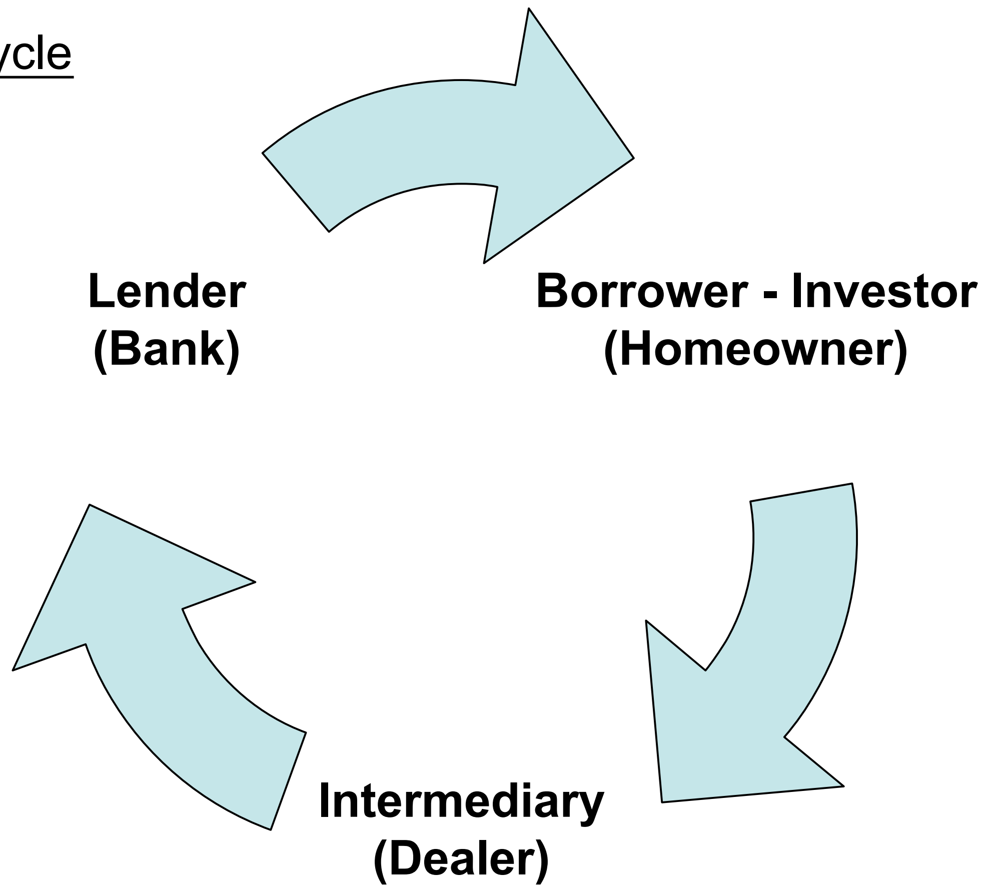
Mortgage Asset Creation

The Credit Cycle



Mortgage Asset Creation

Bank Credit is extended to homeowners based on:

- ✓ Loan to Value Ratio (loan value / house value)
- ✓ Annual Income
- ✓ Debt to Income Ratio (income / all debt obligations)
- ✓ Credit Scores (e.g. FICO Score)
- ✓ Type of Property (single family, condo, apartment)
- ✓ Loan Characteristics (fixed rate or adjustable rate)

Mortgage Asset Creation

Mortgage Loans are classified as

- ✓ Government Agency Guaranteed
- ✓ Prime
- ✓ Alt-A
- ✓ Subprime

based on the credit characteristics of the borrower and the type of documentation that was provided by the borrower at the time the loan was made.

Mortgage Asset Creation

US Bank and Thrift Assets and Liabilities (2Q08)

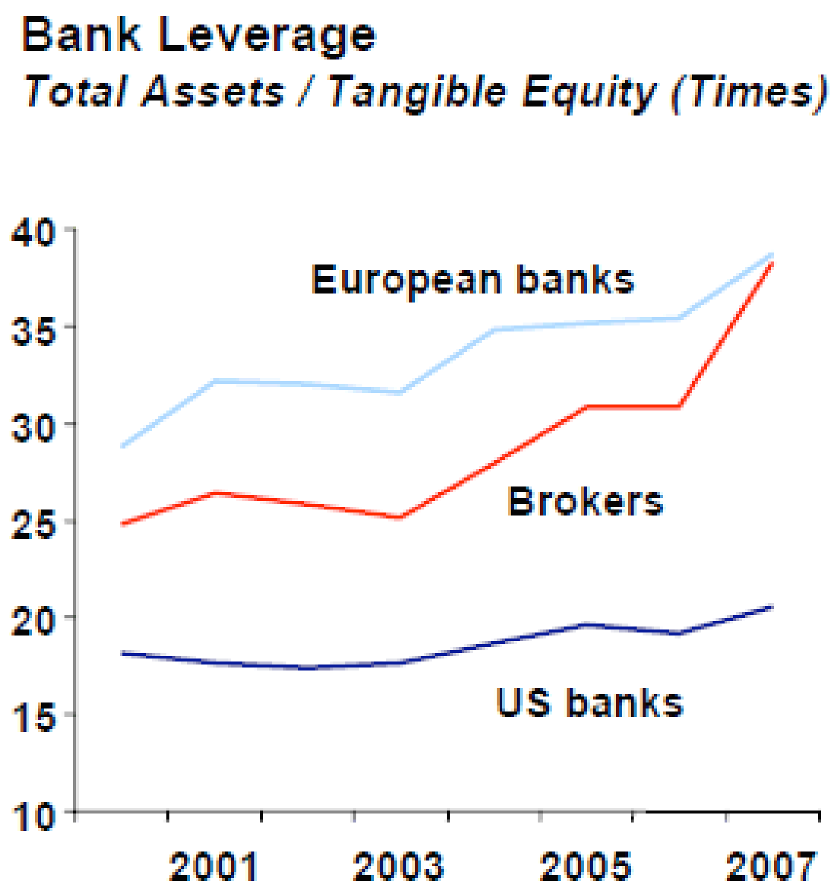
Assets	$bn	Liabilities	$bn
Cash	147	Deposits	7,889
Total Credit	10,895	Short-term Liabilites	3,609
Securities	2,749		
Loans	8,146	Long-term Liabilities	1,625
Bank Loans	2,184		
Mortgages	4,778		
Consumer Credit	903		
Misc	2,469		
Total Assets	**13,511**	**Total Liabilities**	**13,123**

Mortgage Asset Creation

Banks must hold equity for each loan held

- For Commercial Banks, equity is typically 5% of the amount of the loan. Leverage = A / E.
- The SEC lowered the capital requirement for Brokerage Firms in April 2004.
- Equity is expensive so capital requirements limit the total amount of loans that can be made.

Mortgage Asset Creation



Source: Citigroup Investment Research.

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Structures & Risk Sharing

- Mortgage Loans can be pooled into Securities, and these securities are sold to investors.
- Securities are created so that portions of the total credit risk (potential losses) in a pool of mortgages can be sold to different classes of investors.
- Once a Security is sold, the equity backing the asset is freed up, and can be applied to new loans.

Structures & Risk Sharing

Investors classes:

- ✓ Investment Grade: Low Risk, Low Expected Credit Losses, Low Returns, Par Price (~$100)

- ✓ Non-Investment Grade: High Risk, High Credit Losses, High Returns, Discount Price (<$100)

Banks maximize revenue by optimizing the credit structure of the security to fit the risk tolerances of multiple classes of investors.

Structures & Risk Sharing

Exhibit 2

4-Year Idealized Loss Rates Used to Model Structure Finance Ratings

Aaa	0.00%	Ba1	2.31%
Aa1	0.01%	Ba2	3.74%
Aa2	0.03%	Ba3	5.38%
Aa3	0.06%	B1	7.62%
A1	0.10%	B2	9.97%
A2	0.19%	B3	13.22%
A3	0.30%	Caa1	17.86%
Baa1	0.46%	Caa2	24.13%
Baa2	0.66%	Caa3	36.43%
Baa3	1.31%	Ca	50.00%
		C	100.00%

Source: Moody's

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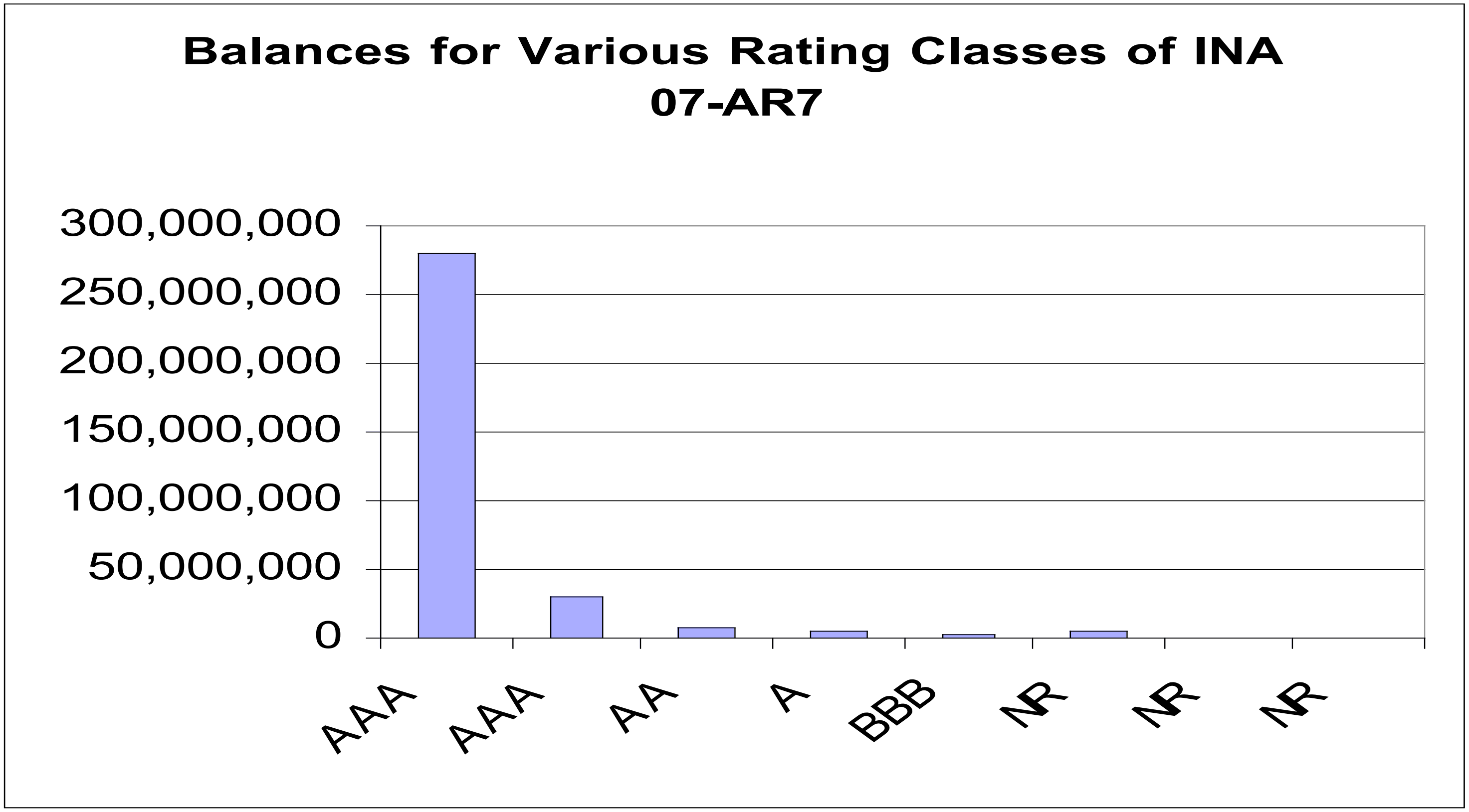
Structures & Risk Sharing



Source: Bloomberg

Structures & Risk Sharing

Class	Original Balance	Current Balance	Principal Type	Original Credit Support (Pct)	Current Credit Support (Pct)	Rating
1A1	278,880,000	239,826,979	SEN_SPR	15.3	16.1	AAA
1A2	30,987,000	26,647,729	SEN_SUP	5.9	6.8	AAA
IB1	6,915,000	6,910,679	JUN	3.8	4.4	AA
IB2	4,445,000	4,442,223	JUN	2.5	2.8	A
IB3	2,800,000	2,798,250	JUN	1.6	1.8	BBB
IB4	3,951,000	3,948,531	JUN_NO	0.4	0.5	NR
IB5	823,000	822,486	JUN_NO	0.2	0.2	NR
IB6	494,744	494,435	JUN_NO	0.0	0.0	NR
Total Collat G1	**329,295,844**	**285,891,313**				
Super Senior	278,880,000	239,826,979	16.113%			AAA
Mez Senior	30,987,000	26,647,729	6.792%	5.900%		AAA
Support Subs	19,428,744	19,416,604	0			AA-NR
	329,295,744	285,891,312				

Structures & Risk Sharing

Estimated Lifetime Losses for Indymac Production (Percent)

	2005 March	2005 June	2005 Dec	2006 March	2006 June	2007 March	2007 Dec	2008 March
Agency	0.21	0.22	0.20	0.22	0.22			
Prime Alt-A	0.58	0.58	0.59	0.59	0.59			
Subprime	1.99	1.80	2.05	1.57	1.67			
Total	**0.47**	**0.42**	**0.51**	**0.51**	**0.51**	**1.86**	**0.43**	**0.23**

Source: Indymac 10Q Reports

Capital, Leverage, & Liquidity

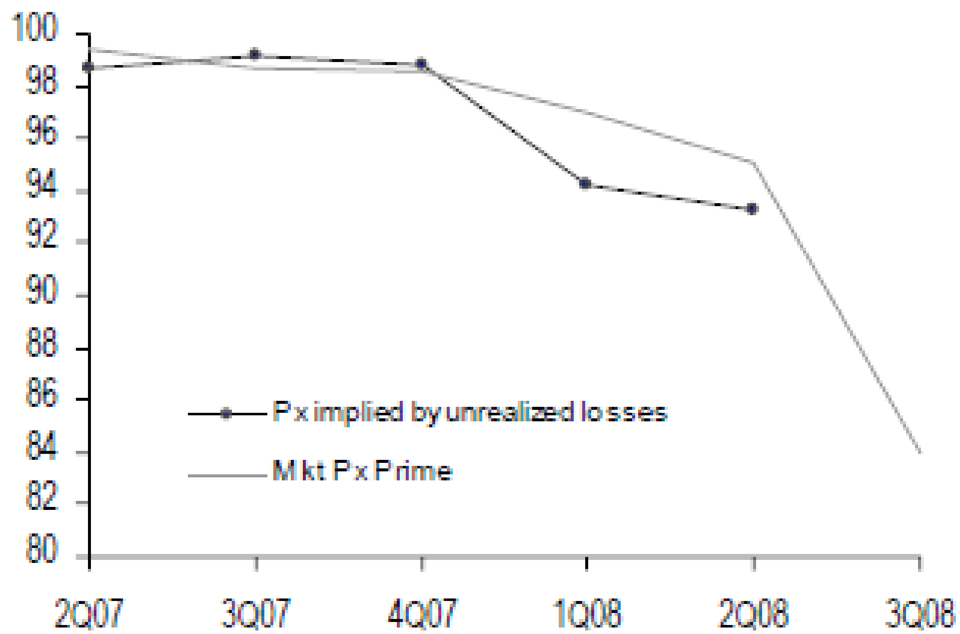
The Mortgage Credit Crisis developed as

a. Banks overextended (increased volume & leverage) due to competitive pressures, and in doing so, allowed Consumers to overextend
b. As a result, Credit Quality worsened
c. Leading to greater Credit Losses
d. As losses mounted, Liquidity vanished
e. Outcome: Extending Credit & Holding Assets became less attractive, freezing the credit cycle

Capital, Leverage, & Liquidity

Chart 4: Banks have marked down securities, but probably have more room to go

Generic market price of AAA non-agency prime MBS and estimated price marked by banks implied by unrealized gain/loss in non-agency MBS portfolios



Source: JPMorgan, Federal Reserve, company reports

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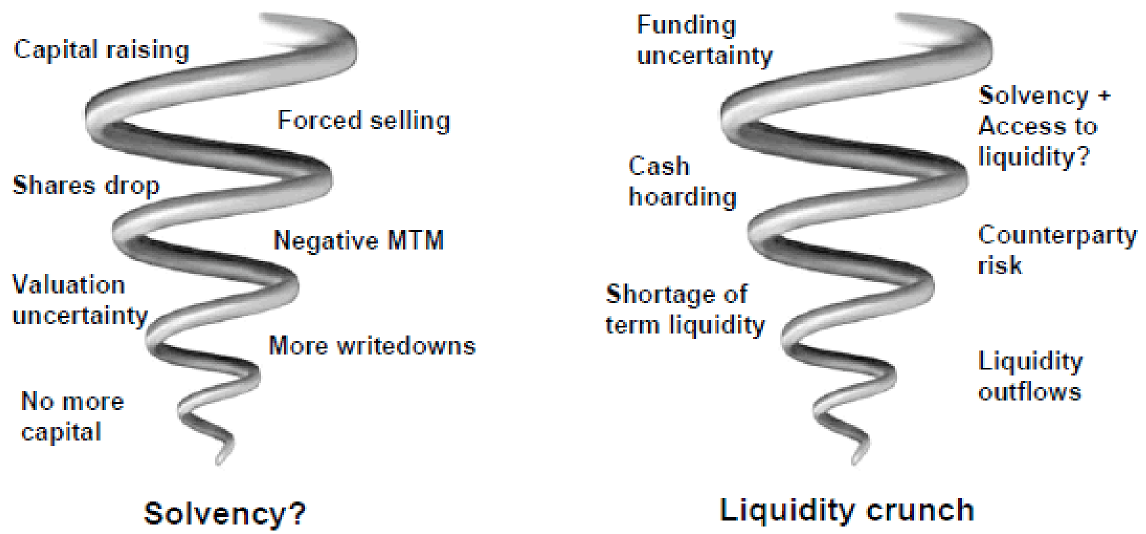
Capital, Leverage, & Liquidity

The twin spirals…

citi

Writedowns on thin capital bases + Excessive reliance on wholesale funding



Source: Citi.

… have led to a collapse in confidence

fixed income strategy and analysis

Citigroup Global Markets Ltd. 2

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Capital, Leverage, & Liquidity

Table 2: Government capital investments improve banks' capital, and could fuel MBS demand

Assets, leverage (defined as total assets/shareholders equity), announced government capital investments, and writedowns for selected US banks

U.S. Bank	Assets, $bn	2Q/3Q 08 Leverage= assets/equity	$bn Govt. Investment	Post investment Leverage= assets/equity	$bn Writedowns
Citigroup Inc.*	2,050	16	25	14	68
JPMorgan Chase & Co.*	2,251	15	25	13	21
Bank of America Corporation*	1,831	11	25	10	27
Wells Fargo & Company*	622	13	25	9	18
U.S. Bancorp	247	11			1
Bank of New York Mellon Corporation*	268	10	3	9	-
SunTrust Banks, Inc.	177	10			-
Broker-Dealers	**Assets, $bn**	**Leverage= assets/equity**	**$bn Govt. Investment**	**Post investment Leverage**	**$bn Writedowns**
Goldman Sachs Group, Inc. *	1,082	22	10	18	5
Morgan Stanley *	987	30	10	22	16

As of 3Q08(*), otherwise 2Q08.
Source: Company reports, SNL, Bloomberg, *The Wall Street Journal*

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Crisis Timeline

Jul07	Bear’s Mortgage Hedge fund collapses
Jan08	Bank of America buys out Countrywide
Mar08	JPMorgan buys out Bear Stearns
Jul08	Indymac seized by Federal Regulators
Sep08	Regulators seize FNMA & FHLMC
Sep08	Lehman files for bankruptcy protection
Sep08	AIG accepts loan from the FED
Sep08	WaMu is seized by Federal Regulators
Sep08	Congress approves bailout fund
Oct08	Wachovia is purchased by Wells

Options to Restore Confidence

- Raise new Capital (Morgan Stanley)
- Conservatorship (FNMA, FHLMC, IMB)
- Bankruptcy (Lehman)
- Mergers & Sales (Merrill Lynch, WaMu, Wachovia)
- Government Intervention: TARP & Liquidity Provisions
  - Buy troubled assets to restore liquidity
  - Provide capital to banks
  - Guarantee short-term bank debt

Questions

Presentations materials available at www.carlplat.com