The Financial Crisis and the Bailout

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Intro

- This talk:
  - What is the problem?
  - How did we get here?
  - What do we need to do?
  - What does the bailout do and not do?
  - What else should be done?

- Acknowledgments:
  - Rely heavily on my colleagues.
    - » Doug Diamond
    - » Anil Kashyap
    - » Raghu Rajan
    - » Amir Sufi
    - » Luigi Zingales

What is the problem?

- Look at a typical bank balance sheet.
- Deposits, short-term debt, long-term debt and equity fund
- Loans (and investments in securities).
  - Include mortgages and mortgage-related securities.

Loans	100	Deposits	70
		Short-term Debt	10
		Long-term Debt	10
		Equity	10

What is the problem?

- Mortgage (and other?) losses substantial at some financial institutions.
- Losses are meaningful relative to equity bases of levered institutions.

Loans	100	Deposits	70
		Short-term Debt	10
		Long-term Debt	10
		Equity	10

What is the problem?

- Mortgage (and other?) losses are substantial at financial institutions.
- Losses are meaningful relative to equity bases of levered institutions.
- Restoration requires rebuilding capital base of these institutions.

Loans	~~100~~	92?	Deposits	70	
			Short-term Debt	10	
			Long-term Debt	10	
			Equity	~~10~~	2?

Once there is concern, then bigger problems

- When equity capital is low, financial institutions can:
  - Sell loans.
  - Raise equity

- They usually sell assets first.
  - When equity goes down, bank becomes overleveraged.
  - Selling loans (at book value) and paying down debt reduces leverage.

What is the problem?

- Sell loans of 50 for 50.
- Still highly leveraged but:
  - less highly leveraged.
  - have substantially reduced lending.

Loans	~~100~~	~~92~~	42
Deposits	~~70~~		30
Short-term Debt	~~10~~		5
Long-term Debt	~~10~~		5
Equity	~~10~~		2?

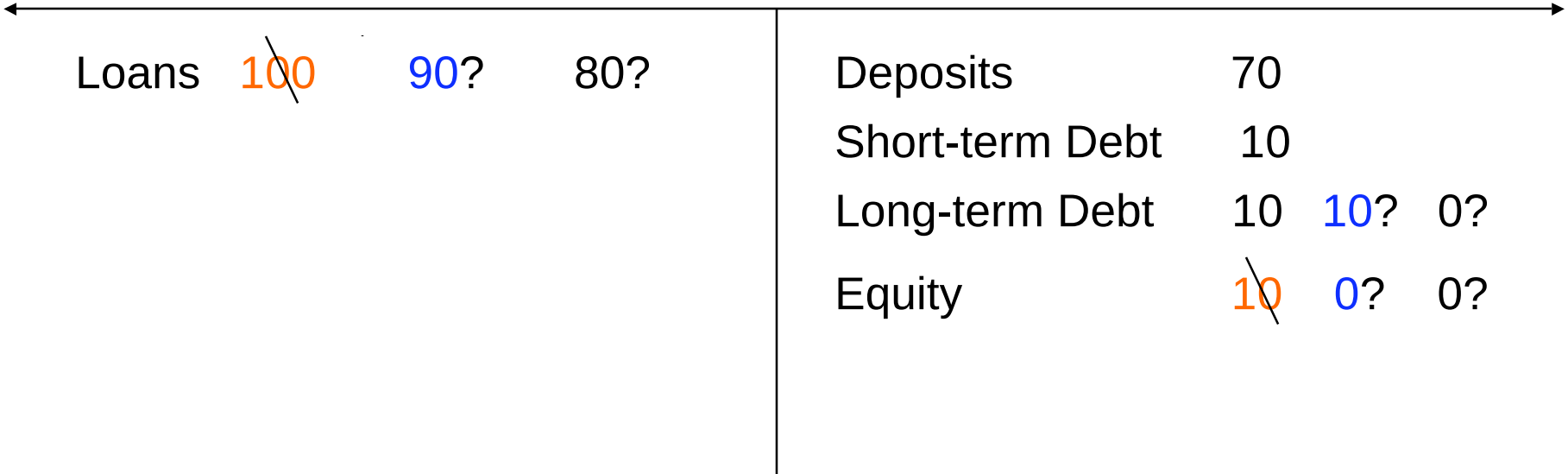
- Unfortunately:
  - Hard to sell loans at book value.
  - Selling loans and assets depresses prices of other loans and assets.
    - » Which in turn reduces the equity capital of all banks.
  - This reduces the amount of bank lending.

- More unfortunately:
  - When lenders and other counterparties begin to question the solvency of a financial institution, they stop lending and transacting with the bank.
    - » This is a particularly big problem if the bank / institution relies on short-term debt. (E.g., Lehman.)
    - » So you can have a “bank run” even if the institution is solvent (or would be solvent) under normal conditions.

- At the peak of the crisis:
  - Everyone is suspicious of everyone else.
  - No short-term credit available.
    - » Banks will not lend to each other short-term.
  - Lots of mini-runs.
    - » Rumors of trouble lead to runs on deposits, short-term debt.
  - ==> Downward spiral.

Key Issue: What are loans really worth?

- At current trading prices, loans are worth 90(?).
  - Could be worth 90 because of bank run type behavior.
    - » I.e., fear, distressed selling.
    - » If markets calm, may really be worth 100.
  - Could fundamentally be worth 90.
  - Could be worth less than 90, say 80?



How did we get here?

Excessive credit

- Global mismatch between desired savings and realized investment.
  - Emerging markets and developing countries have lots of $ relative to investment needs.
    - » Demand for high rated paper.
    - » Demand for short maturities.

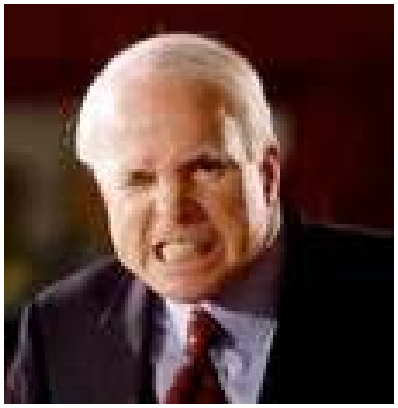
- Accommodative monetary policy.
  - Strong credit growth = Asset prices up, especially housing,
    - » Not just US – Ireland, Spain, UK…

- Accommodative regulatory policy.
  - Wanted to make housing available to more lower income borrowers (even if they could not really afford it).
  - HUD increased affordable housing mandate for Fannie and Freddie.
    - » From 42% to 50% (in 2000) to 56% (in 2004) of loans must be to low and moderate income borrowers.
  - American Dream Downpayment Act (late 2003).
    - » $200 m annually for downpayment assistance to low-income ..first-time homebuyers and increased loan limit for FHA insurance for purchasing multifamily units in high cost areas.

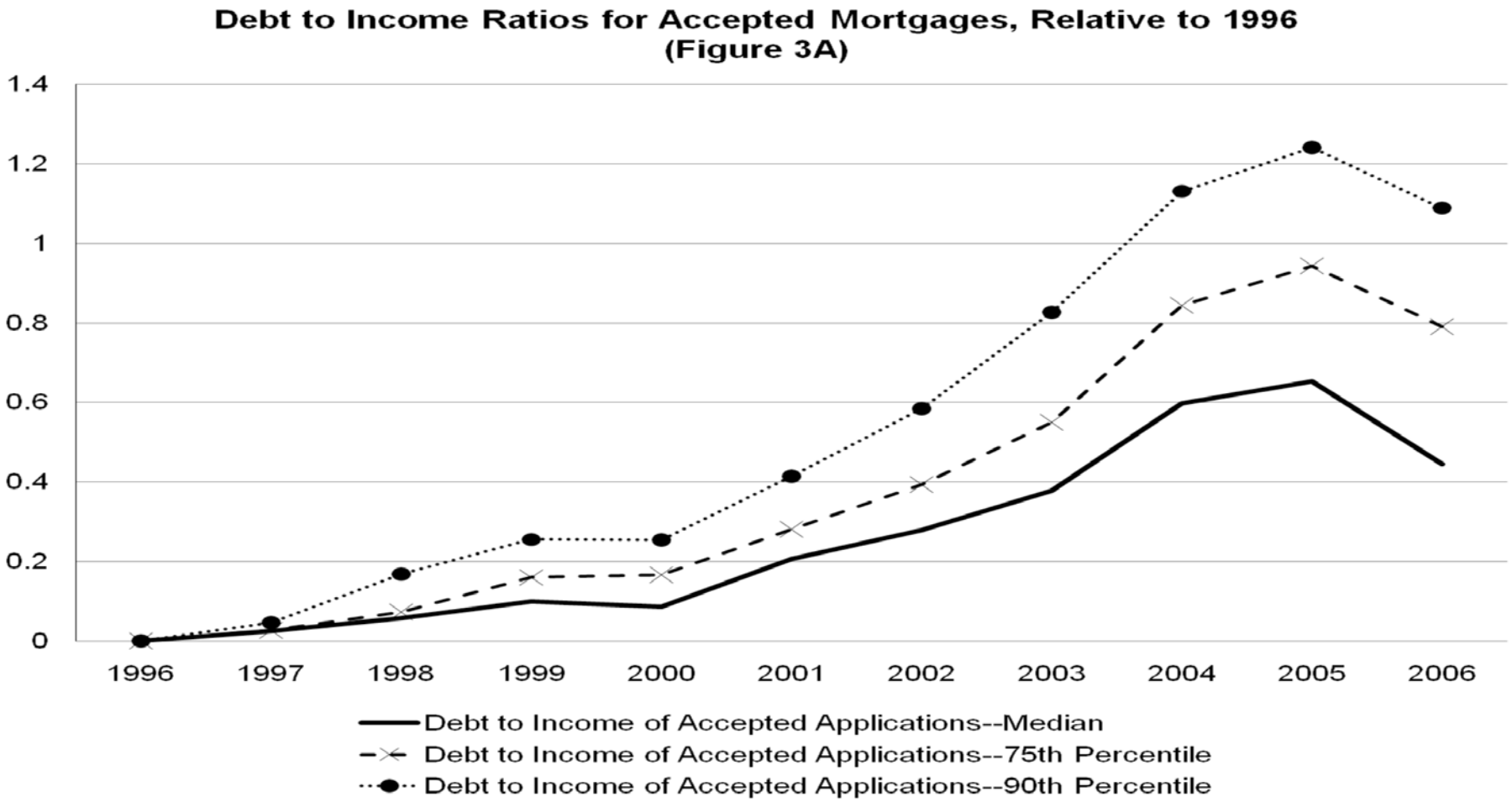
Credit evaluation broke down / made mistakes

- Mortgages were securitized.
  - Mortgages pooled together and then sold in the capital market
  - These pools were broken up into different tranches of debt with different seniority.
  - Based on past returns and housing prices, senior tranches were considered safe.
- Rating agencies provided ratings that were too high.
  - Just got it wrong by extrapolating historical housing prices.
  - Just got it wrong by not understanding systemic risk / correlations.
  - Had incentives to get it wrong because fees paid by relatively few issuers.
- Original lenders / packagers.
  - Were paid for originating.
  - Were able to sell to others based on ratings.

Some scary pictures.



From Mian and Sufi (2008)



From Hatzius, Kashyap et al.

% of Originations by Product (except for Total Loans)									
Year	**FHA/VA**	**Conform-ing**	**Jumbo**	**Sub-prime**	**Alt-A**	**HEL**	**ARMs**	**Refinan-ces**	**Total Loans ($Bn)**
2001	7.9%	57.1%	20.1%	7.2%	2.5%	5.2%	16.0%	58.6%	2215
2002	6.1%	59.1%	19.8%	6.9%	2.3%	5.7%	23.5%	63.1%	2885
2003	5.6%	62.4%	16.5%	7.9%	2.2%	5.6%	26.2%	72.0%	3945
2004	4.5%	41.4%	17.5%	18.2%	6.3%	12.2%	50.1%	54.7%	2920
2005	2.9%	34.9%	18.3%	20.0%	12.2%	11.7%	47.8%	50.4%	3120
2006	2.7%	33.2%	16.1%	20.1%	13.4%	14.4%	45.0%	49.0%	2980
1Q06	2.7%	33.5%	14.6%	19.9%	14.9%	14.5%	42.1%	49.4%	705
2Q06	2.5%	34.4%	15.8%	20.6%	13.0%	13.8%	49.0%	47.8%	800
3Q06	2.9%	31.9%	17.0%	21.2%	12.1%	15.0%	44.0%	48.7%	755
4Q06	2.6%	33.1%	17.1%	18.8%	13.9%	14.6%	44.3%	50.3%	720
1Q07	2.8%	40.1%	14.7%	13.7%	14.4%	14.3%	35.3%	57.1%	680
2Q07	3.4%	44.9%	16.4%	7.7%	13.2%	14.4%	30.1%	51.6%	730
3Q07	4.6%	50.2%	14.6%	4.9%	9.5%	16.3%	29.1%	46.1%	570
4Q07	6.9%	61.0%	9.8%	3.0%	6.0%	13.3%	21.8%	52.0%	450

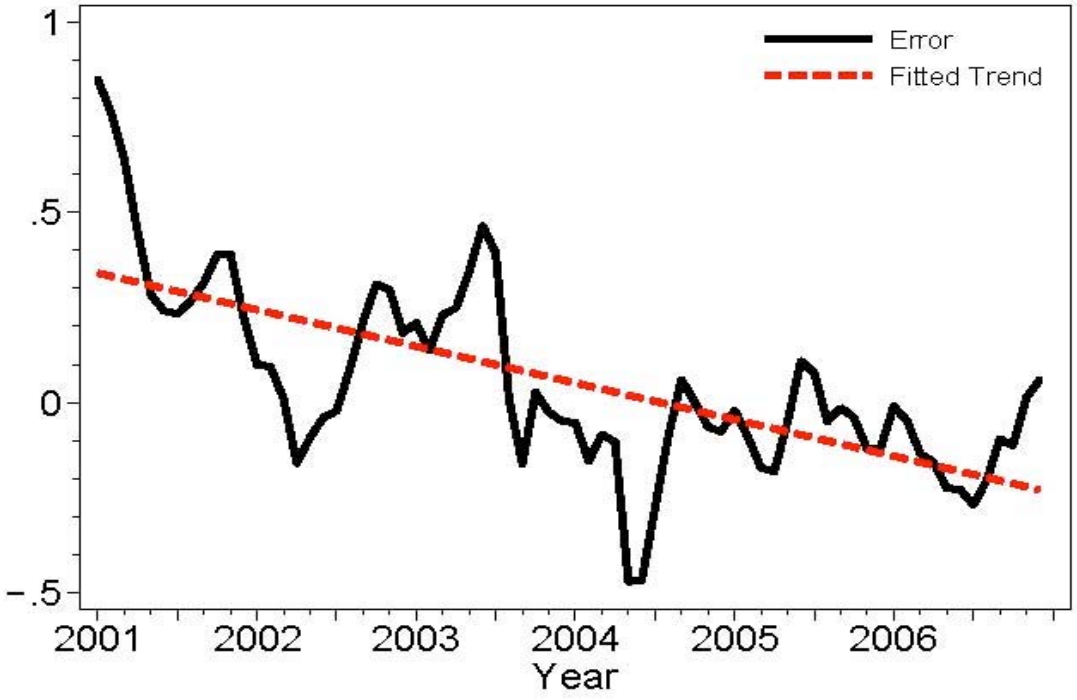
Source: Inside Mortgage Finance, Morgan Stanley.

Distribution of Subprime Loans

Year	All Subprime	AAA	AA	A	BBB	BB/Other
	100%	80.8%	9.6%	5.0%	3.5%	1.1%
2005	625	505	60	31	22	7
1Q06	140	113	13	7	5	2
2Q06	165	133	16	8	6	2
3Q06	160	129	15	8	6	2
4Q06	135	109	13	7	5	1
1Q07	95	77	9	5	3	1
2Q07	56	45	5	3	2	1
3Q07	28	23	3	1	1	0
4Q07	14	11	1	1	1	0
Total: 2005-2007	**1,418**	**1,145**	**135**	**71**	**51**	**16**

Source: Inside Mortgage Finance. Morgan Stanley.

Subprime-prime interest spread from 2001 to 2007, after controlling for loan characteristics (from Demyanyk and Hemert (2007))



Hatzius 2008 Mortgage Credit Loss Projections

	Total Losses (Billions of Dollars)		
	Prices Flat at mid-2008 Level	**Prices Fall 10% from mid-2008 Level**	**Prices Fall 20% from mid-2008 Level**
2007Q1	5	5	5
2007Q2	8	8	8
2007Q3	13	13	13
2007Q4	19	19	19
2008Q1	27	27	27
2008Q2	37	37	37
2008Q3	39	46	51
2008Q4	36	52	66
2009Q1	30	48	74
2009Q2	25	45	82
2009Q3	23	40	74
2009Q4	20	35	62
2010Q1	19	30	47
2010Q2	18	26	38
2010Q3	17	24	34
2010Q4	16	22	30
2011Q1	16	21	28
2011Q2	16	21	27
2011Q3	15	20	26
2011Q4	15	20	25
2012Q1	**15**	**19**	**24**
2012Q2	15	19	24
2012Q3	15	19	23
2012Q4	15	19	23
07Q1-12Q4	**473**	**636**	**868**

Source: Our calculations.

Allocation of Losses: U.S. Financials will bear 50% of losses

Home Mortgage Exposure of US Leveraged Institutions (2007 Q4)	Billion ($)
Total	**11,136**
US Leveraged Institutions	**6,134**
Commercial banks	**2,984**
Direct	2,012
RMBS	971
Savings Institutions	**1,105**
Direct	840
RMBS	265
Credit Unions	**351**
Direct	311
RMBS (estimate)	40
Finance Companies	**474**
Direct	474
RMBS	0
Brokers and Dealers	**257**
Direct	0
RMBS (estimate)	257
Government-Sponsored Enterprises	**963**
Direct	445
RMBS (estimate)	519

Leverage of Various Financial Institutions

	Assets ($bn)	Liabilities ($bn)	Capital ($bn)	Leverage
Commercial banks	11194	10050	1144	9.8
Savings Inst	1815	1607	208	8.7
Credit Unions	759	672	87	8.7
Finance Companies	1911	1720	191	10.0
Brokers/hedge funds	5597	5390	207	27.1
GSEs	1669	1598	71	23.5
Total - Leveraged Sector	**22945**	**21037**	**1908**	**12.0**

Source: Authors' calculations based on 2008 Q4 Flow of Funds, FDIC Statistics on Banking, Adrian and Shin (2007), and balance sheet data for Fannie Mae, Freddie Mac, and broker-dealers under Goldman Sachs equity analyst coverage.

What do we need to do now?

- Depends on what loans really worth in non-bank-run / calm markets.
  - If Loans = 100 in calm markets, goal should be to calm markets.
  - If Loans = 90 (even in calm markets), goal should be to re-equitize banks and financial institutions.
  - If Loans less than 90, need to re-equitize and restructure banks and financial institutions.

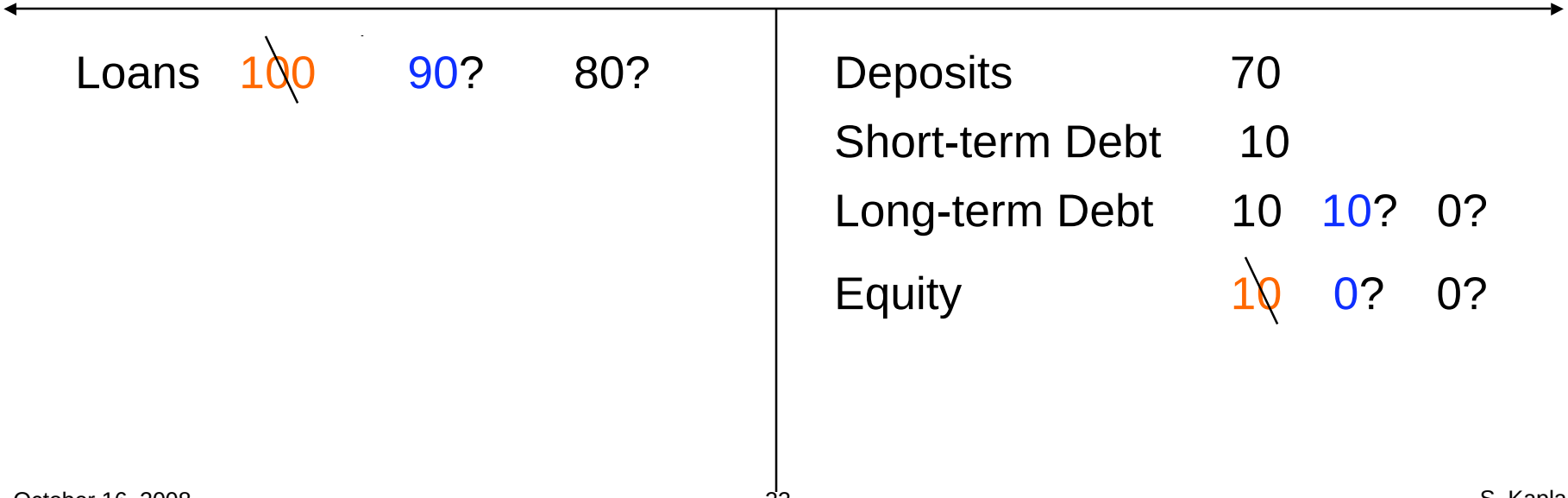
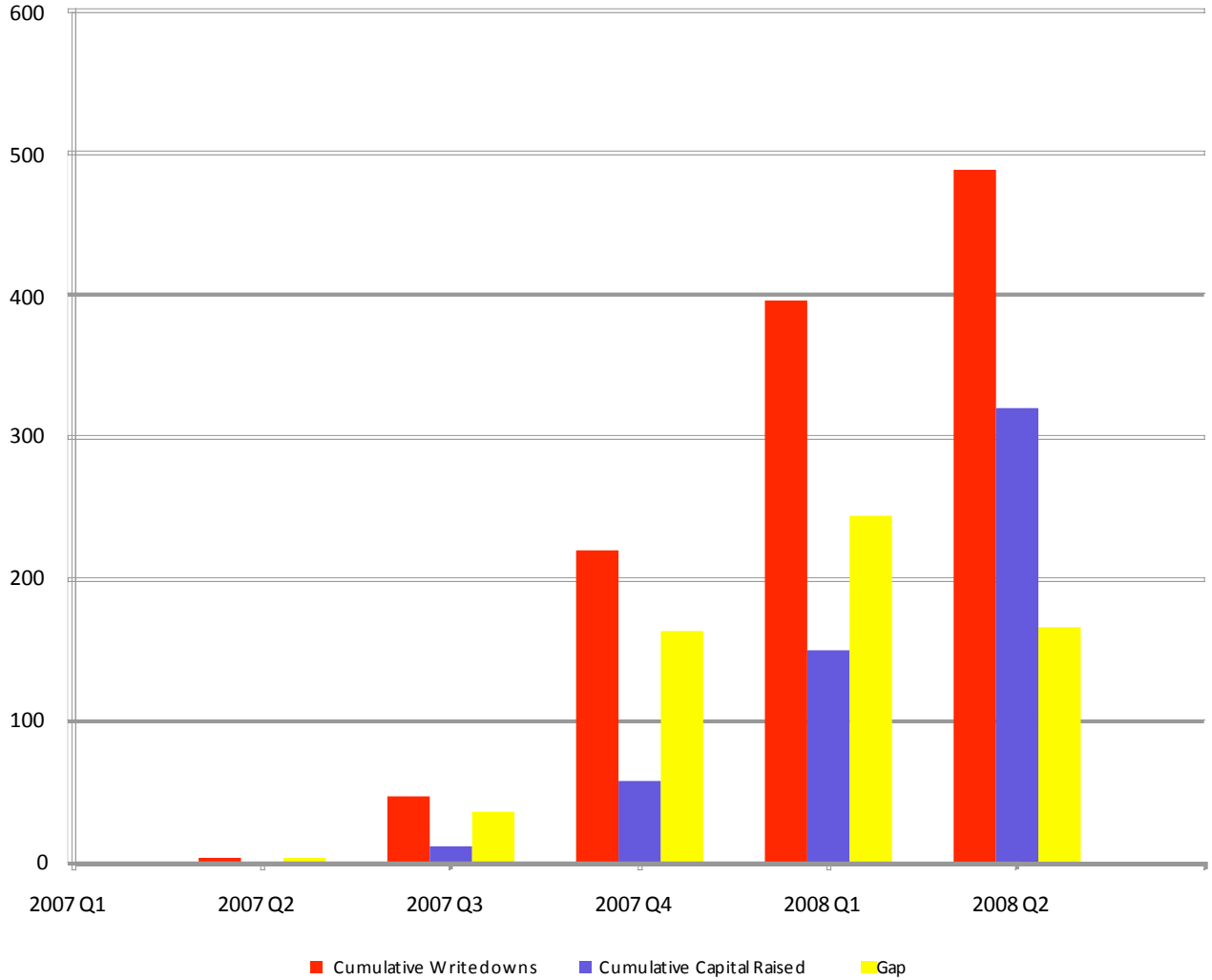


Figure 1: Progress Towards Recapitalization by Global Financial Firms



Source: Bloomberg, WDCI <GO> accessed August 6, 2008

What do we need to do now?

- If Equity = 10 in calm markets, goal should be to calm markets.
  - = Initial Paulson Plan.

Loans	100	Deposits	70
		Short-term Debt	10
		Long-term Debt	10
		Equity	10

What do we need to do now?

- If Equity = 0 even in calm markets, goal should be to re-equitize banks and financial institutions.

Loans	~~100~~	90	Deposits	70	
			Short-term Debt	10	
			Long-term Debt	10	
			Equity	~~10~~	0

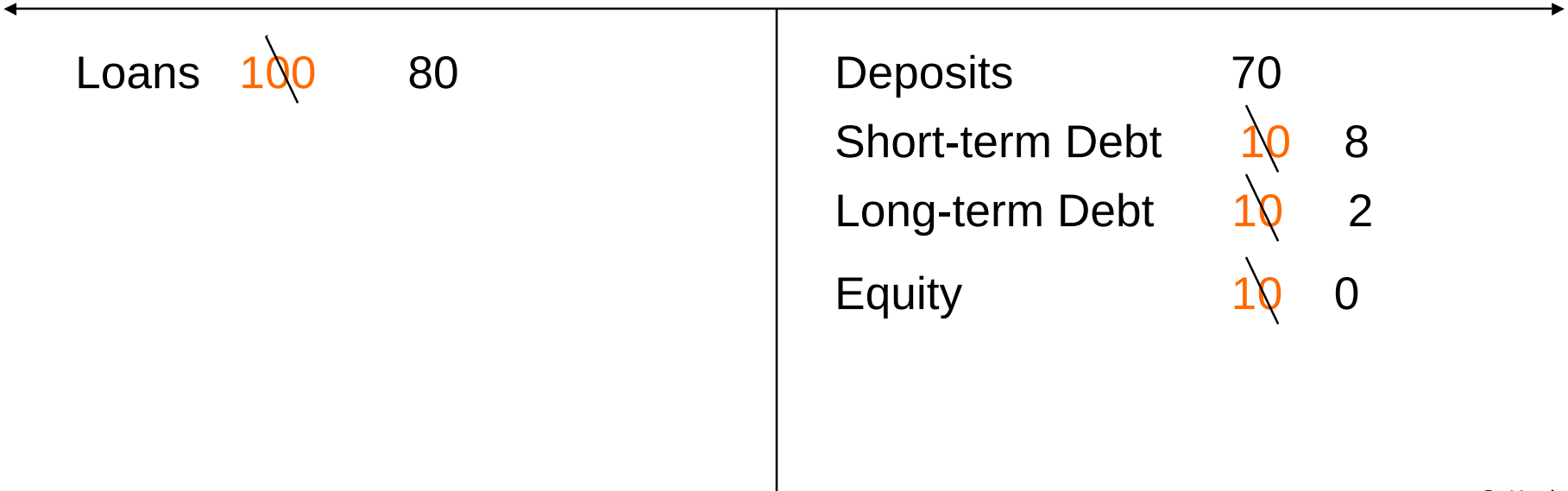
What do we need to do now?

- If Equity = 0 even in calm markets, goal should be to re-equitize banks and financial institutions.
  - Infusion should come in the form of new common, or, more likely, as preferred stock.

Loans	~~100~~	90	Deposits		70
Cash		10	Short-term Debt		10
			Long-term Debt		10
			Preferred / New Equity		10
			Old Equity	~~10~~	0

What do we need to do now?

- If Loans worth less than 90, need to re-equitize and restructure.
  - Equity is worth 0.
  - Long-term and short-term debt really worth less than promised value of 10.
    - » Debt overhang problem.



What do we need to do now?

- If Loans worth less than 90, need to re-equitize and restructure.
  - Equity is worth 0.
  - Long-term debt is really worth less than promised value of 10.

- Putting in equity does not solve the problem.
  - It is a give-away to long-term debt.

Loans	~~100~~	80	Deposits	70	
Cash		10	Short-term Debt	~~8~~	10
			Long-term Debt	~~2~~	10
			New Equity / Pfd.	~~10~~	0
			Equity	~~10~~	0

What do we need to do now?

- If Loans worth less than 90, need to re-equitize and restructure.
  - Equity is worth 0.
  - Long-term debt is really worth less than promised value of 10.
- Need to:
  - restructure debt to equity.
  - put in new equity.

Loans	~~100~~	80	Deposits		70
Cash		10	Short-term Debt		0
			Long-term Debt		0
			Equity for Debt		10
			New Equity from Cash		10
			Old Equity	~~10~~	0

What else do we need to do now?

- Resuscitate the short-term loan / interbank loan market.
- Stop runs from happening.

What did the first bailout plan do?

- Bailout allowed Treasury to buy illiquid financial assets.
  - Will provide liquidity to financial institutions.
  - Will stabilize loan values(?).

- Will this help? Two ways to buy assets:
  - In reverse auction.
    - » Supposed to be at market value.
    - » Treasury gets warrants / equity / senior debt as well.
  - In direct purchase.
    - » Will probably pay above market value, but will get control.

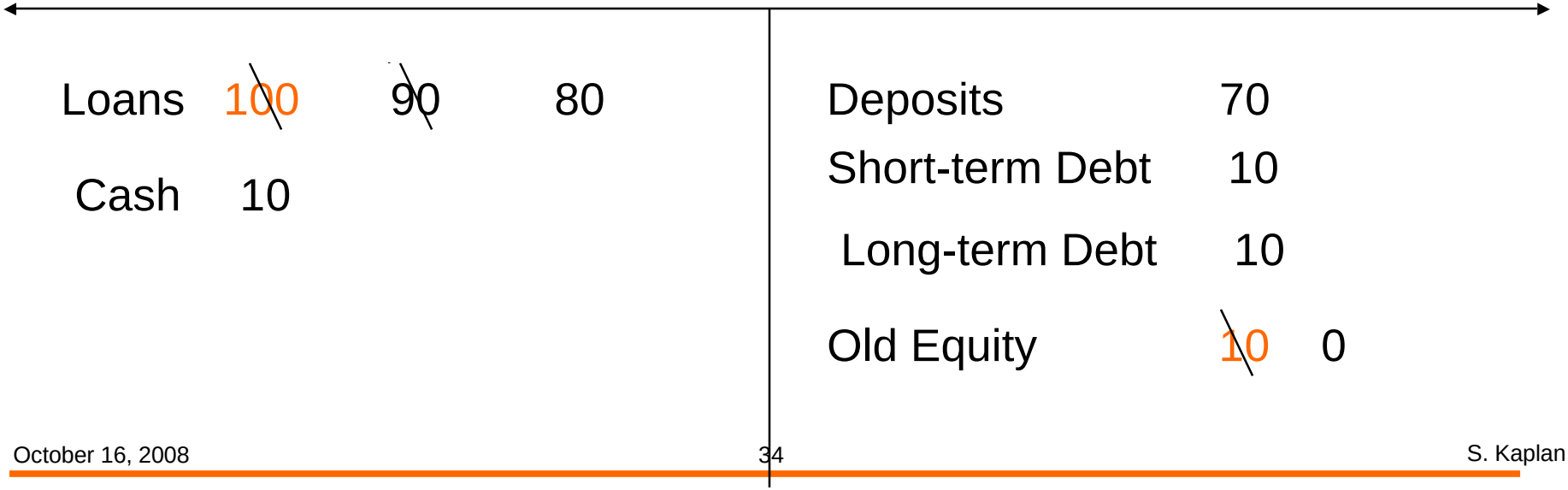
Will First Bailout Help?

- If Loans = 100, Equity = 10 in calm markets, goal is to calm markets.
  - Problem is illiquidity, fear, but banks essentially solvent.
- Bailout helps.
  - Provides liquidity for loans.
  - Supports values closer to “fundamental” not distressed sale value.
  - Will show that banks actually are solvent.

Loans	100	Deposits	70
		Short-term Debt	10
		Long-term Debt	10
		Equity	10

Will First Bailout Help?

- If Loans = 90, Equity = 0 even in calm markets, goal is to re-equitize banks and financial institutions.
- Not clear bailout helps.
  - If buy loans at market value, then does not re-equitize banks.



Will First Bailout Help?

- If Loans = 90, Equity = 0 even in calm markets, goal is to re-equitize banks and financial institutions.
- Not clear bailout helps.
  - If buy loans above market value, then helps a little.
    - » Pay 15 for loans worth 10.
    - » But not very efficient.
      - Have to pay 15 to infuse equity of 5.

Loans	~~100~~	~~90~~	80	Deposits	70
Cash	15			Short-term Debt	10
				Long-term Debt	10
				Old Equity	~~10~~ 5

Will First Bailout Help?

- If Loans worth less than 90, need to re-equitize and restructure.
- Buying loans, even at premium, only helps long-term debt.
  - Waste of taxpayer $.

Loans	~~100~~	~~80~~	70
Cash			15

Deposits	~~70~~	~~70~~	70
Short-term Debt	~~10~~	~~10~~	10
Long-term Debt	~~0~~	~~0~~	5
Old Equity	~~10~~	~~0~~	0

What Happened?

- The first bailout plan failed.
- Market clearly believed loans not worth 100.
  - So, we know market believes loans are worth less than 95.
- U.S. and European governments have no choice, but 2nd bailout plan.

What does the second bailout plan do?

- U.S. Treasury (and European Treasuries):
  - Infuse equity into banks.
    - » Forbid dividend payments on common(?).
  - Guarantee short-term bank loans.

Will Second Bailout Help?

- Pretty clear loans not worth 100.
- If Loans = 90, Equity = 0, goal is to re-equitize banks and financial institutions.
- Bailout helps.
  - Banks no longer insolvent.
  - Short-term debt is guaranteed.

Loans	~~100~~	90	Deposits		70
Cash		5	Short-term Debt		10
			Long-term Debt		10
			Old Equity	~~10~~	5

Will Second Bailout Help?

- If Loans worth less than 90, need to re-equitize and restructure.
- Not clear how much bailout helps.
  - Short-term debt is guaranteed.
    - » Should help interbank market.
  - But, banks still insolvent.
  - And, taxpayers have given money to debt investors.

Loans	~~100~~	~~80~~	80
Cash			5

Deposits	~~70~~	~~70~~	70
Short-term Debt	~~10~~	~~10~~	10
Long-term Debt	~~0~~	~~0~~	5
New Equity			0
Old Equity	~~10~~	~~0~~	0

Bottom line:
Bailout Plan Efficacy Depends on How Bad Loans Are

- If loans are not so bad, then bailout plan is terrific.
- If loans are very bad:
  - bailout plan transfers $ to long-term debt investors.
  - will need to restructure banks further, converting long-term debt and short-term debt(?) into equity.
- In all likelihood, some banks are solvent and some are not.
  - So efficacy of plan is mixed.

Summary

- First bailout plan flawed from the start.
- Second bailout plan is right thing to try.
  - Equity infusions desirable.
  - Guarantee of short-term loans desirable.
  -
- Efficacy of second bailout plan depends on extent to which banking system is solvent or insolvent.
  - Possible the second bailout plan solves the problem.
  - Possible that second bailout plan will not do enough and we will need to restructure insolvent banks;