



Stronger Regulation - Changes for Which Risk Management Should be Prepared

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Viral Acharya

Professor of Finance
NYU Stern School of Business



Steve Lindo

Executive Director
PRMIA

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Changes for which Risk Management Should be Prepared

Systemic Risk, Stronger Regulation and Liquidity Management

Viral V Acharya

NYU-Stern, NBER, CEPR and ECGI

February 2010

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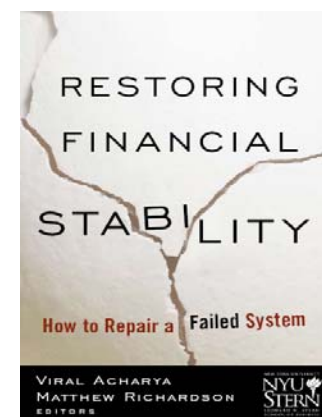
Email: EMSRM@stern.nyu.edu

NYU-Stern Working Group on Financial Sector Reforms



- *Restoring Financial Stability: How to Repair a Failed System, John Wiley and Sons, March 2009*

- <http://whitepapers.stern.nyu.edu/home.html>
- Joint effort of 33 faculty members at NYU Stern
- Edited by Viral Acharya and Matthew Richardson
- 18 White Papers on Financial Crisis
 - Causes of the Financial Crisis
 - Four Principles for Future Regulation



- *Rewriting Financial Regulation: Evaluating the Congressional Proposals, Dec 2009 (forthcoming, John Wiley and Sons)*

- <http://govtpolicyrecs.stern.nyu.edu/home.html>
- Real-time commentary on HR 4173, the Wall Street Reform and Consumer Protection Act of 2009 and Senate's Restoring American Financial Stability Act (forthcoming)

Introduction

- An increasingly important question for both academic research and corporate finance in practice is:

How do firms manage their liquidity needs?

- Several alternatives to consider:
 - Future cash flows
 - Future financing (debt, equity, ...)
 - Debt: Bank term loans, public bonds, commercial paper
 - Equity: SEO, private equity injections
 - Bank lines of credit (LC)
 - Cash reserves
 - Treasury holdings and marketable securities
 - Money market accounts

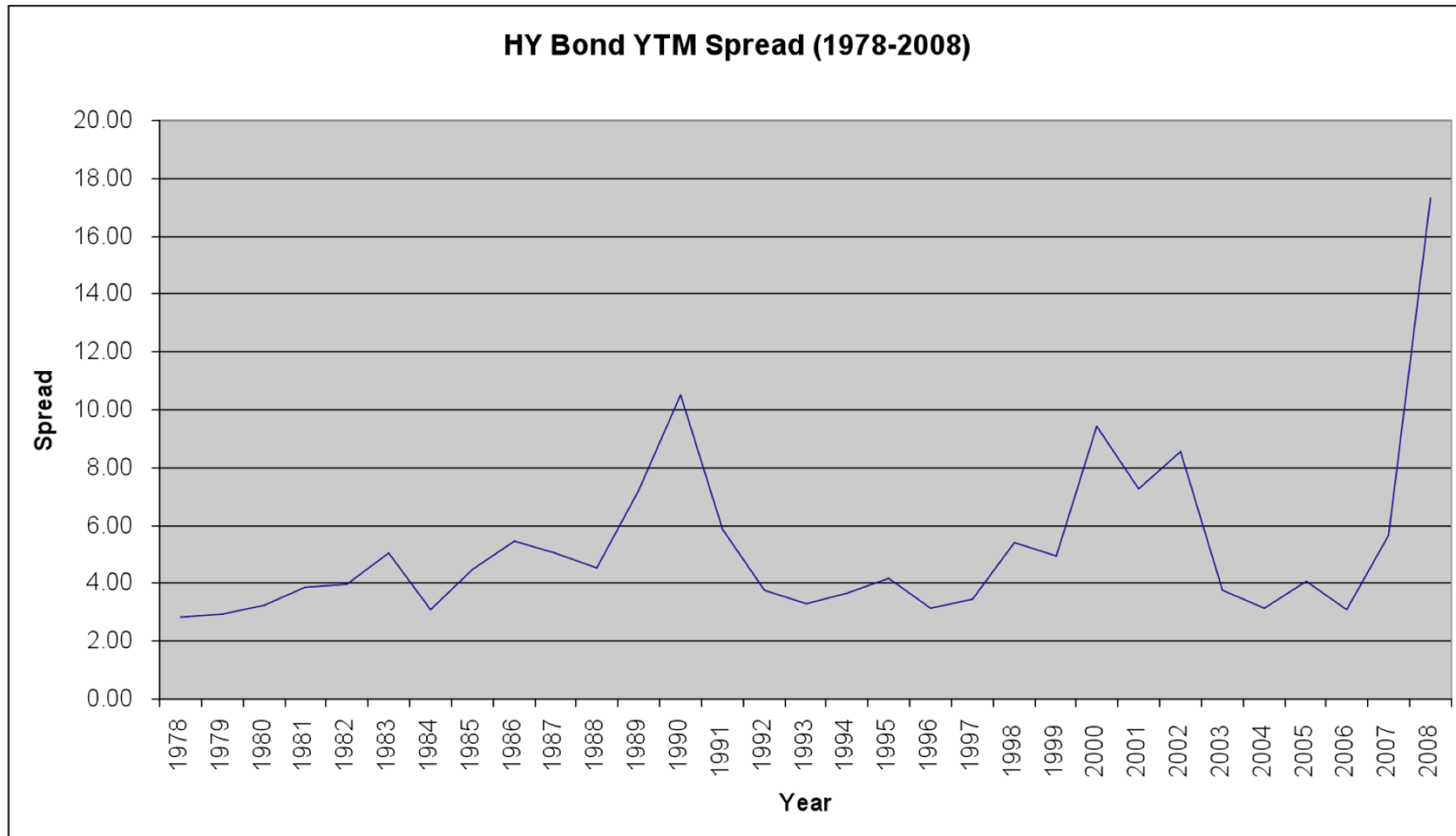
Pros and cons of liquidity management tools

- Future cash flows
 - Internal equity: firm faces only risk of its own cash flows
 - Often investments produce cash flows only with long payback periods
- Future financing (debt, equity, ...)
 - Outside financing: available even if firm has temporary cash flow shortfalls
 - Price can generally not be locked in advance, so subject to market risk
- Bank lines of credit (LC)
 - Efficient to purchase insurance with cash rather than keep cash as storage
 - Counterparty risk (bank may fail), material adverse change (MAC) clause
- Cash reserves
 - Safest form of liquidity (treasuries) but costly due to liquidity premium

Effects of aggregate/systemic risk

- Future cash flows
 - Economic value of projects declines, so cash flows vulnerable
- Future financing (debt, equity, ...)
 - Market risk premium rises enormously
 - Debt financing may dry up completely, especially long-term
 - Firms subject to rollover risk of existing leverage
- Bank lines of credit (LC)
 - Banks may tighten covenants and renegotiation terms and invoke MAC more often
 - Banks may fail exposing firms to replacement risk of new LCs
- Cash reserves
 - Increase in value due to “flight to quality/liquidity” to treasuries

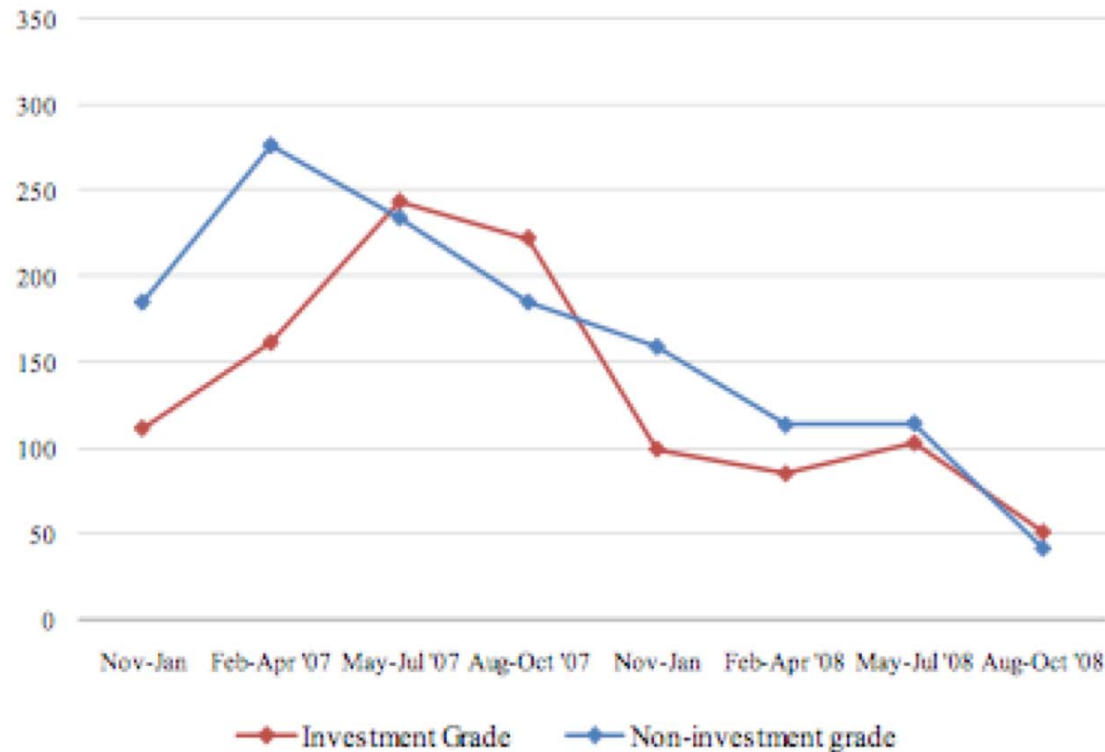
High yield bond spreads (Altman, 2009)



Some recent evidence (Ivashina and Scharfstein, 2009)

Figure 3: Total Loan Issuance, by Corporate Rating (Billion USD)

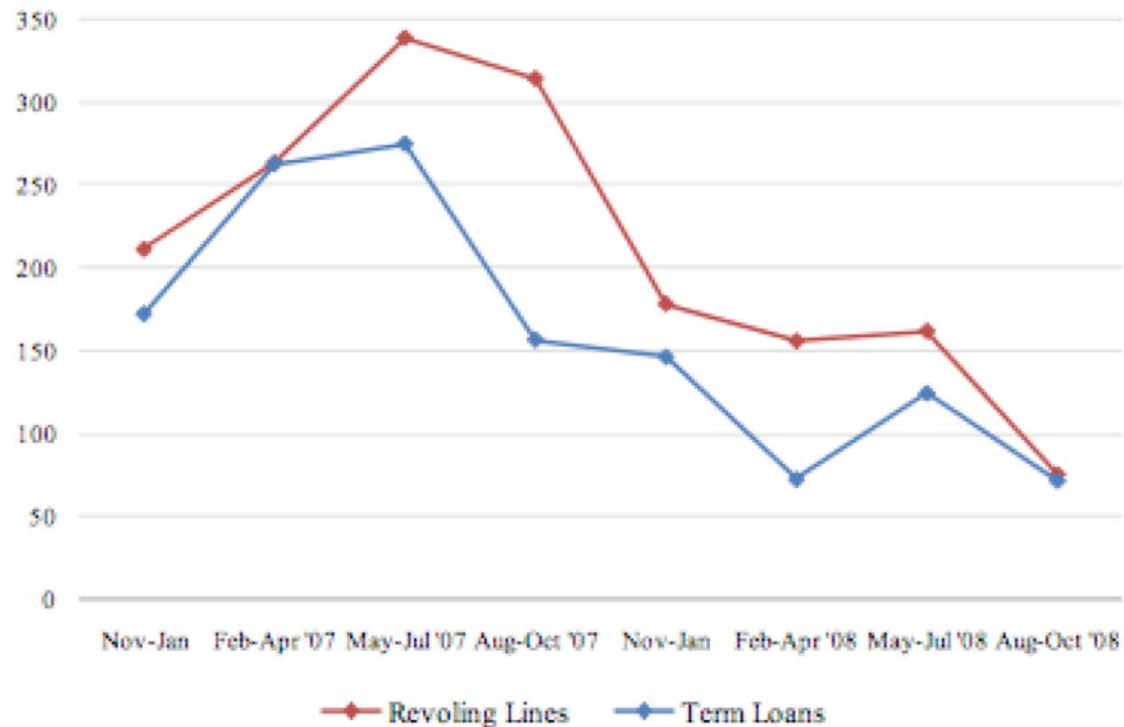
Compiled from DealScan database of loan originations. This figure is based on a sub-sample of loans for which credit ratings are available.



Some recent evidence (Ivashina and Scharfstein, 2009)

Figure 4: Total Issuance of Revolving Credit Facilities vs. Term loans (Billion USD)

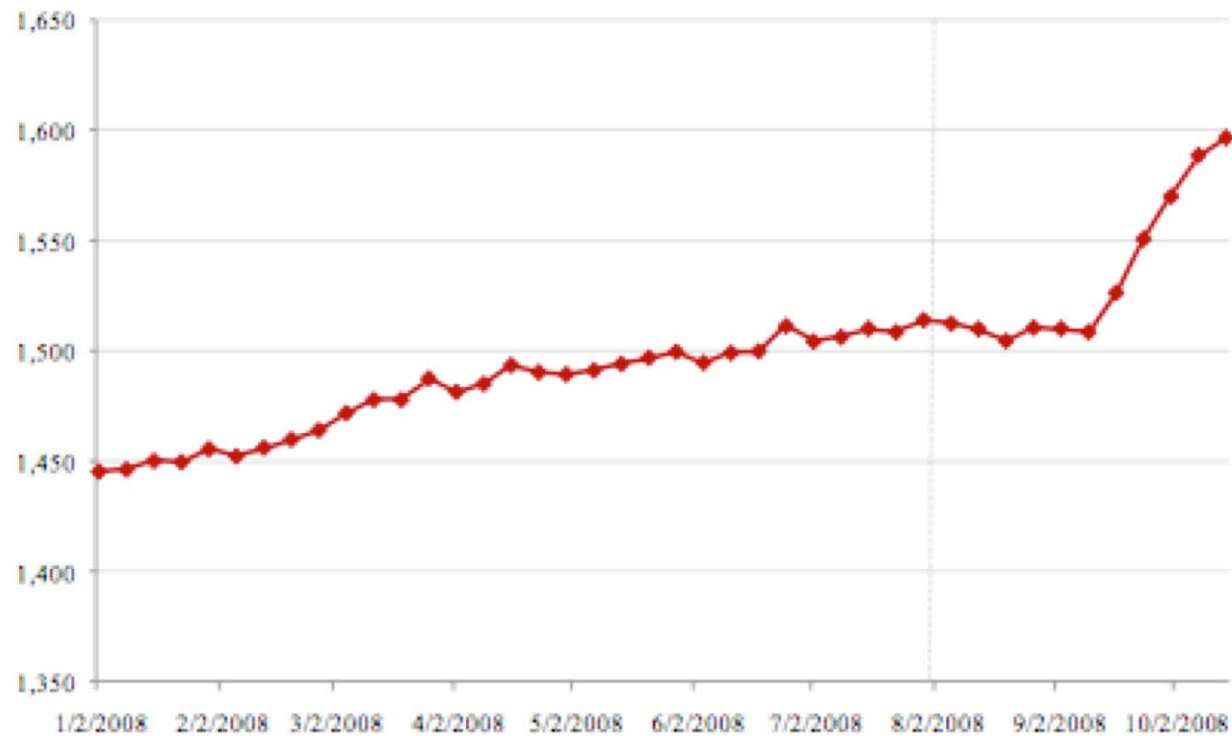
Compiled from DealScan database of loan originations.



Some recent evidence (Ivashina and Scharfstein, 2009)

Figure 5: Commercial and Industrial Bank Credit (Billion USD)

Compiled from Federal Reserve Statistical Release, includes commercial banks in United States.



Some recent evidence (Ivashina and Scharfstein, 2009)

Exhibit 2: Revolving Lines Drawdowns, US Corporate Loans (Billion USD)

Compiled from SEC filings and Reuters.

Date drawn	Company	Current credit rating	Amount drawn (\$MM)	Credit line (\$MM)	Maturity	Spread (Undrawn/ Drawn)	Lead bank	Comment (SEC filings)
08/25/2008	Delta Air Lines	BB-/Ba2	1,000	1,000	2012	50/ L+200	JPM	Simply put, we have taken this action to increase our cash balance as we approach the closing of the merger. We believe this will provide us with the utmost in flexibility – at minimal cost – as we prepare for this critical transition.
09/15/2008	FairPoint Communications	BB+/Ba3	200	200	2014	37.5/ L+275	Lehman Brothers	The Company believes that these actions were necessary to preserve its availability to capital due to Lehman Brothers' level of participation in the Company's debt facilities and the uncertainty surrounding both that firm and the financial markets in general.
9/19/2008	Michaels Stores	B	120	1,000	2011	25/ L+150	Bank of America	The Company took this proactive step to ensure that it had adequate liquidity to meet its cash needs while there are disruptions in the debt markets.
9/22/2008	General Motors	B-/Caa3	3,400	4,100	2011	30/ L+205	Citigroup, JPM	The company said it was drawing down the credit in order to maintain a high level of financial flexibility in the face of uncertain credit markets.
9/26/2008	Goodyear Rubber & Tire Co.	BB+/Baa3	600	1,500	2013	37.5/ L+125	JPM	Temporary delay in the company's ability to access \$360 million currently invested with The Reserve Primary Fund, Goodyear said in a statement. The funds also will be used to support seasonal working capital needs and to enhance the company's liquidity position.

The role of aggregate risk

- How do firms choose whether to hold cash and how much?
- Key insight (Acharya, Almeida and Campello, 2009 – “*Aggregate Risk and the Choice Between Cash and Lines of Credit*”):

Aggregate risk of the firm (say, its beta) should be a key determinant of the firm’s cash and LC-to-cash ratio

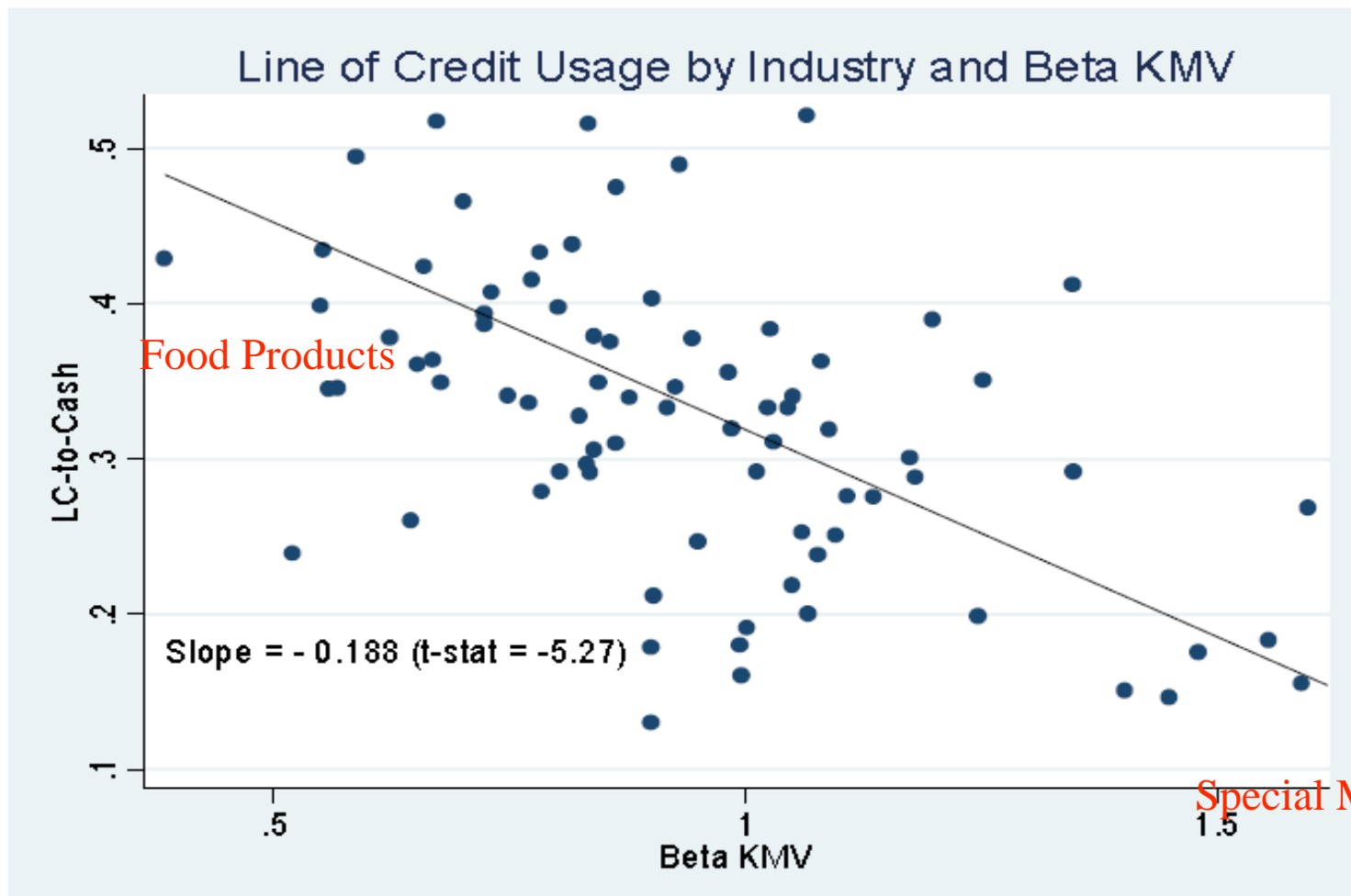
Corollary 1:

- Exposure of a firm to systemic risk of the financial sector (say, its bank beta) should also determine cash holdings

Corollary 2:

- A firm should rely on lines of credit from healthier banks and those that are less vulnerable to systemic crises

Figure 3: Aggregate risk and the choice between cash and credit lines at the industry level.



Polling Question #1

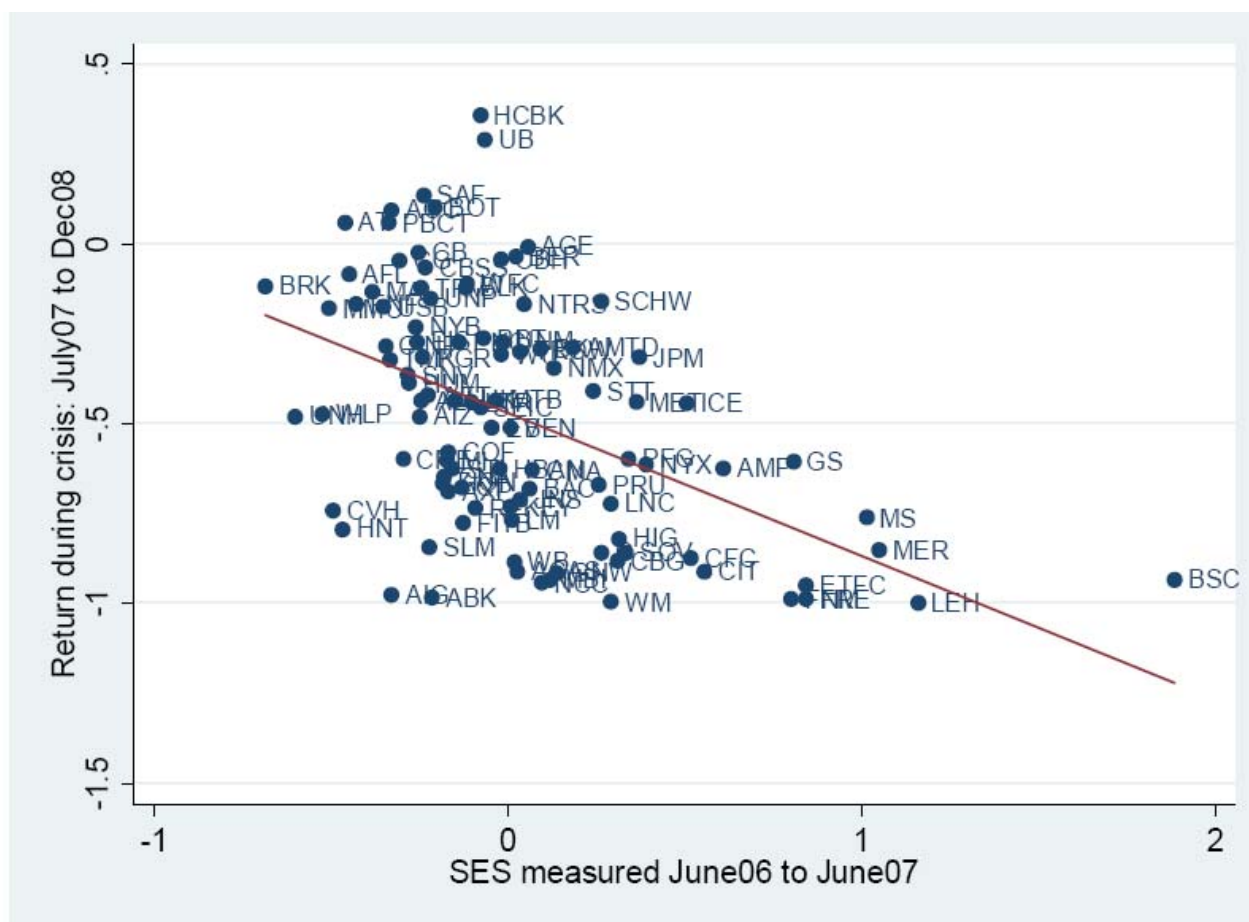
Q: If you were Ben Bernanke, would you raise interest rates right now?

- Yes, to pre-empt inflationary pressures
- No, but a rise in interest rates will be needed soon
- No, the US economy is still too weak to consider tightening monetary policy

How to measure systemic risk of a bank?

- **MES (Marginal Expected Shortfall)**
 - Acharya, Pedersen, Philippon and Richardson (2009) “Measuring Systemic Risk”
 - Very simple non-parametric estimation:
 - find the 5% worst days for the market
 - compute each institution’s average return on these days
 - rank firms by their MES
- **Leverage (Assets to Equity ratio)**
- **MES and Leverage do a remarkable job at predicting which banks did worst in the crisis of 2007-09**

MES and Leverage (SES) predict bank returns



$$Y = -0.47 - 0.40 * SES + \text{error}, \quad \text{adj } R^2 = 23.28\%$$

(-16.09) (-5.60)

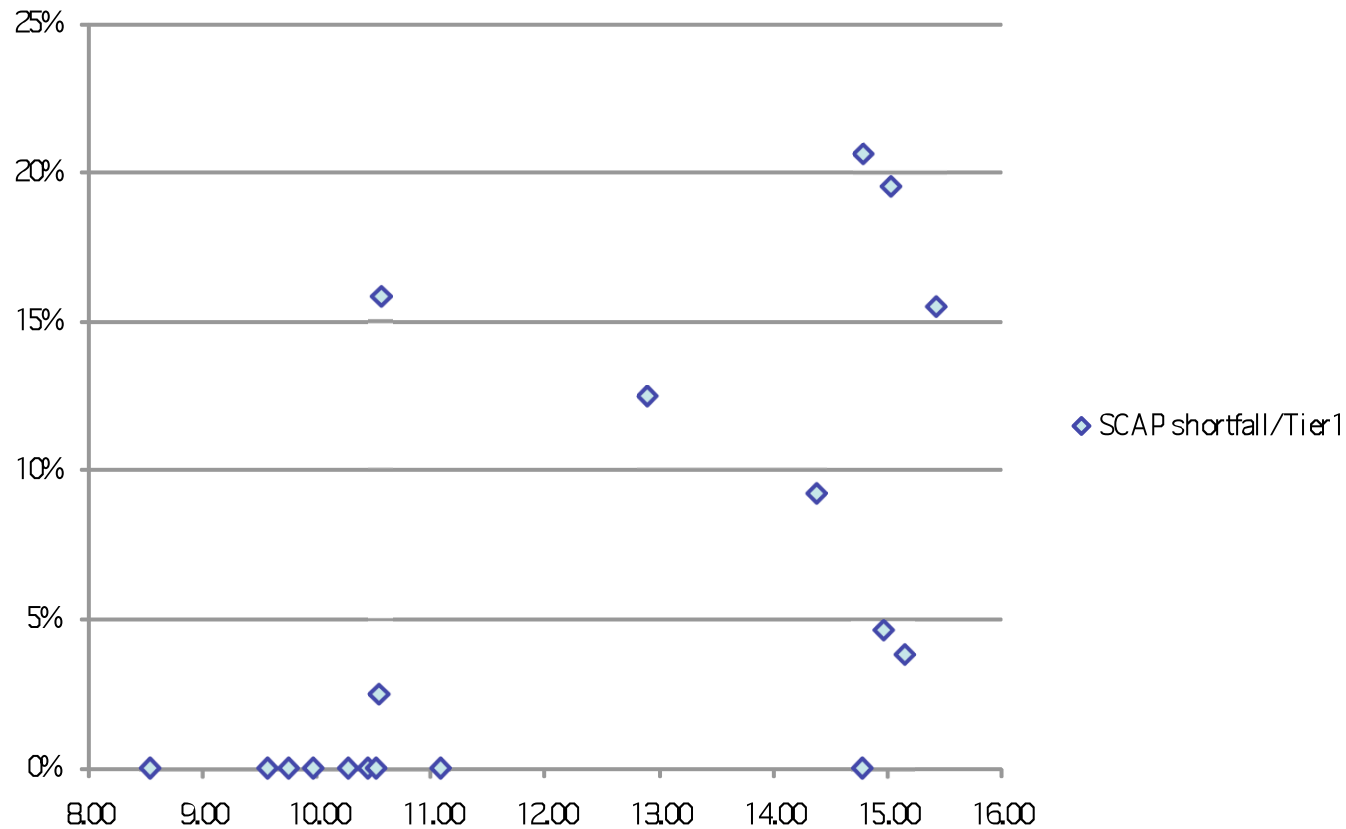
MES & Leverage predict stress test results



ticker	name	SCAP capital shortfall	Tier 1	mes5	mes25	lv	SCAP shortfall/Tier1
JPM	JPMORGAN CHASE & CO	0	136.2	10.45	5.74	20.43213	0%
BK	BANK NEW YORK INC	0	15.4	11.09	6.03	6.464576	0%
AXP	AMERICAN EXPRESS CO	0	10.1	9.75	5.73	7.802068	0%
USB	U S BANCORP DEL	0	24.4	8.54	4.70	10.52866	0%
BBT	B B & T CORP	0	13.4	9.57	4.69	14.77667	0%
STT	STATE STREET CORP	0	14.1	14.79	6.08	10.7906	0%
COF	CAPITAL ONE FINANCIAL CORP	0	16.8	10.52	6.64	33.06011	0%
GS	GOLDMAN SACHS GROUP INC	0	55.9	9.97	4.75	18.9386	0%
MET	METLIFE INC	0	30.1	10.28	5.91	26.13994	0%
PNC	P N C FINANCIAL SERVICES GRP INC	0.6	24.1	10.55	4.84	21.58401	2%
MS	MORGAN STANLEY DEAN WITTER & CO	1.8	47.2	15.17	6.76	25.38902	4%
C	CITIGROUP INC	5.5	118.8	14.98	8.62	126.6788	5%
FITB	FIFTH THIRD BANCORP	1.1	11.9	14.39	6.88	67.16389	9%
STI	SUNTRUST BANKS INC	2.2	17.6	12.91	5.94	39.85384	13%
KEY	KEYCORP NEW	1.8	11.6	15.44	6.86	24.35841	16%
WFC	WELLS FARGO & CO NEW	13.7	86.4	10.57	5.92	20.58423	16%
BAC	BANK OF AMERICA CORP	33.9	173.2	15.05	8.14	50.37743	20%
RF	REGIONS FINANCIAL CORP NEW	2.5	12.1	14.80	7.05	44.41783	21%

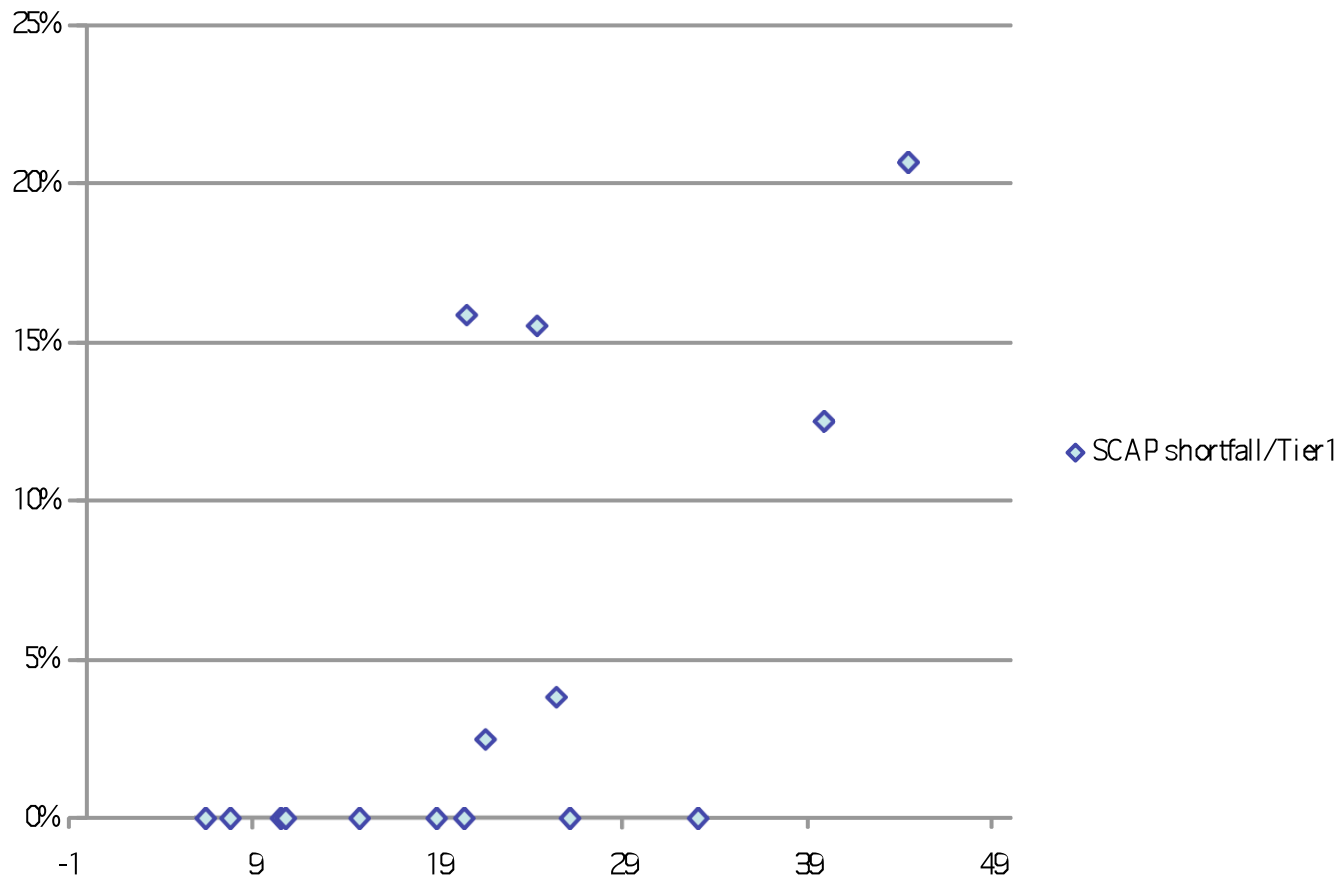
Using MES to predict stress test results

SCAP shortfall/Tier1 vs M ES5



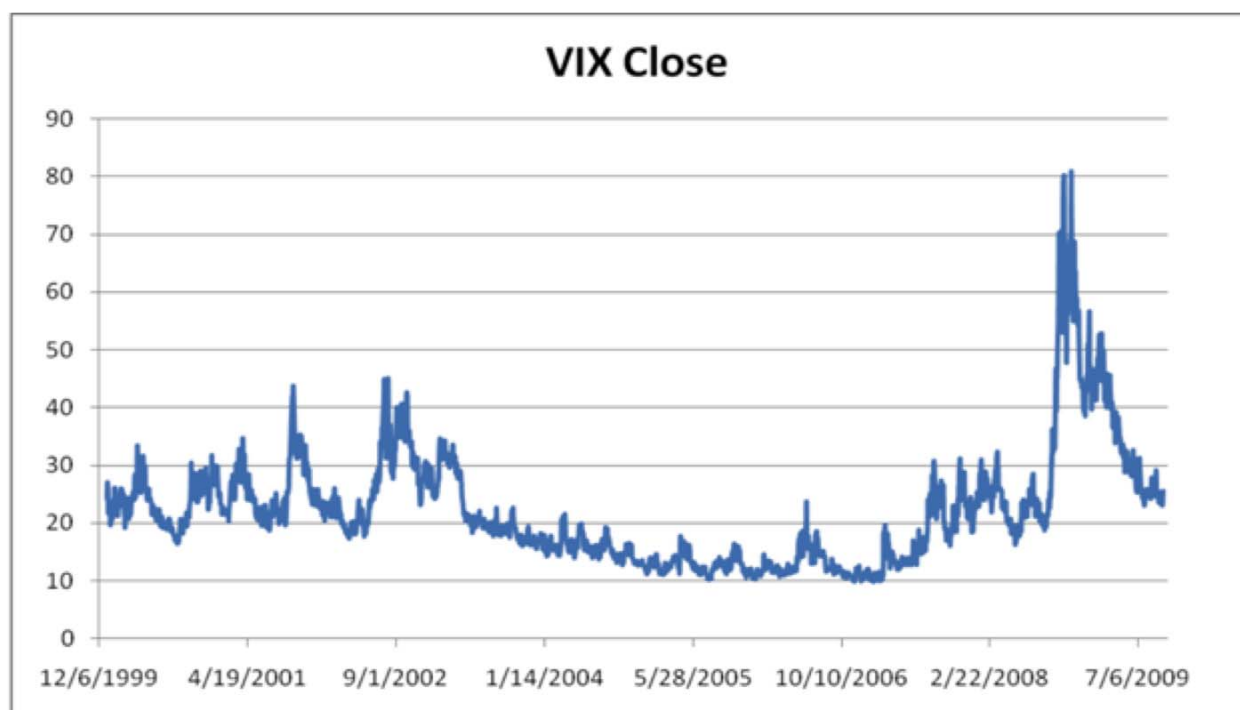
Using Leverage to predict stress test results

SCAP shortfall/Tier1 vs LVG (Quasi A/E)



How does aggregate risk affect cash/LC choice?

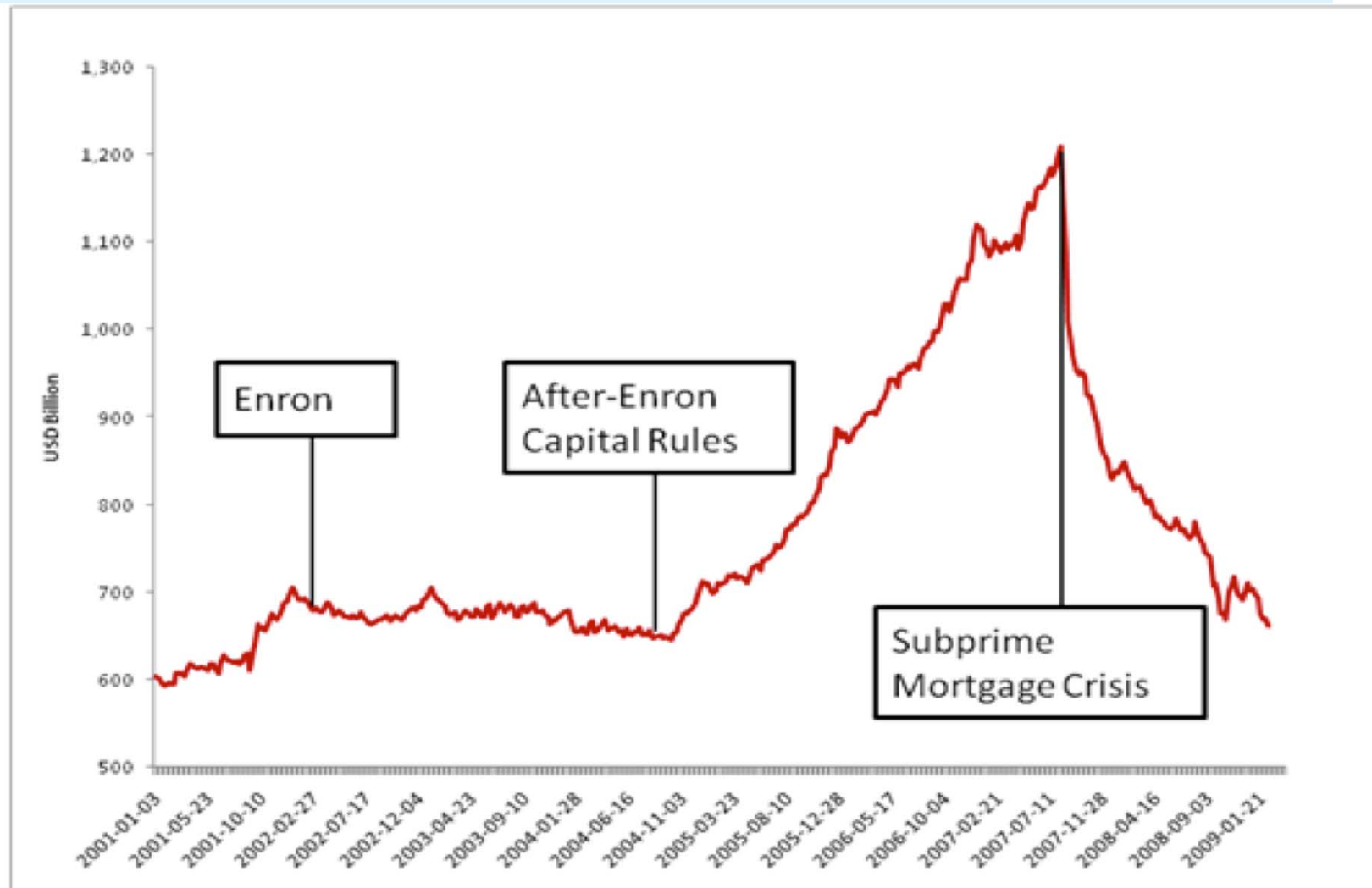
- Effect of aggregate risk on cash-LC substitution is higher
 - When VIX is high: Low “risk appetite” of financial intermediaries
 - When VIX is 10 (good times) versus 80 (stress times)
 - Gap between LC-cash ratio of Food Products versus Machinery magnifies by four times



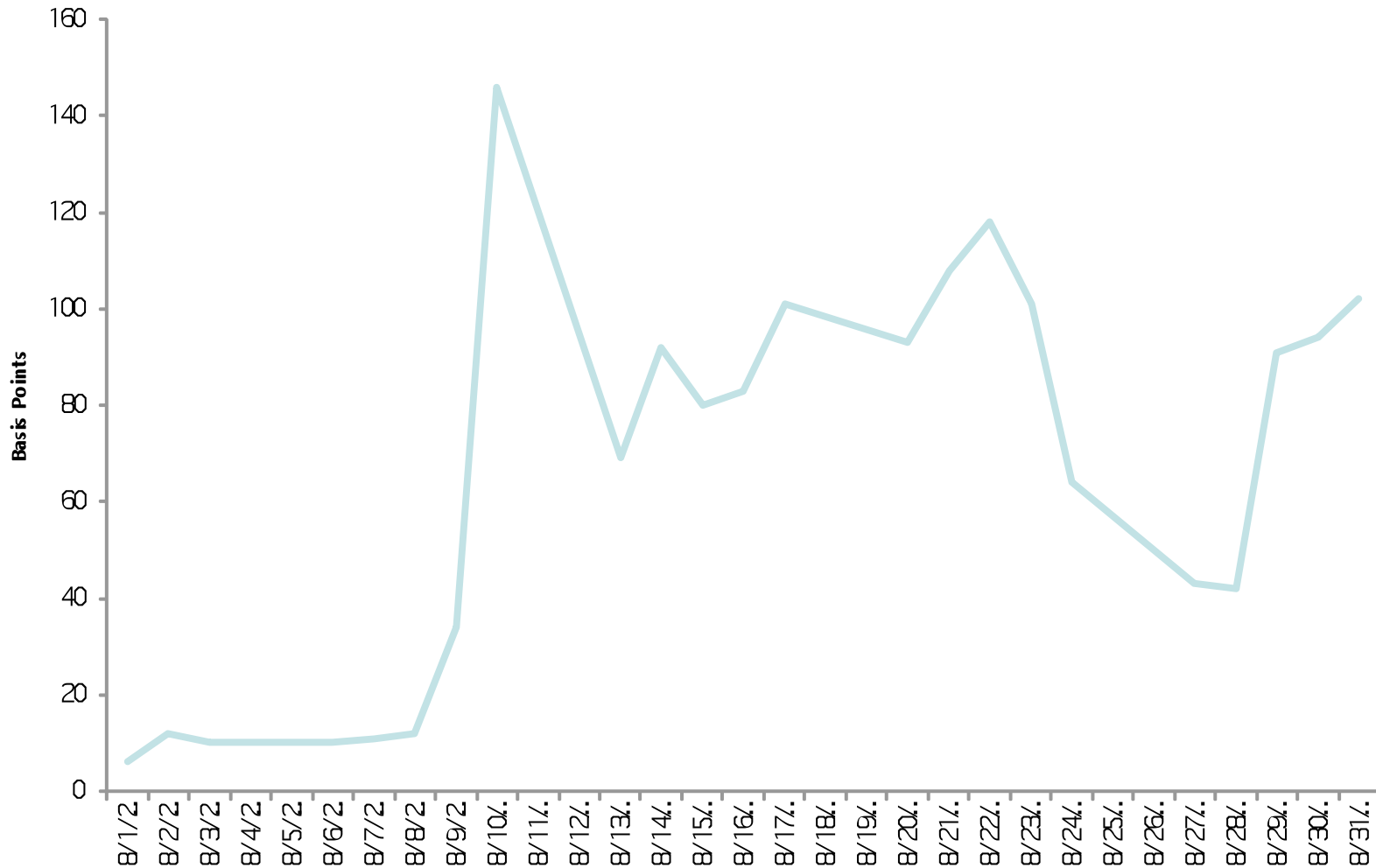
Financial firms, systemic risk and reforms

- Same concepts apply to financial firms, even more so
- Financial firms rely heavily on rollover CP/ABCP financing
 - Extremely vulnerable to market-wide or financial sector-wide stress
- Financial firms should employ stress scenario where even overnight secured funding freezes (Bear Stearns, 2008)
 - Also extremely vulnerable to market-wide or financial sector-wide stress
 - Wholesale funding tends to dry up during stress; deposits more sticky/insured
- Firms should recognize the illiquidity of crowded trades
 - AAA-rated tranches, mortgage-backed exposures: no secondary market
- Firms cannot rely fully on insurance from each other
 - A buys CDS on B from C, and C is as likely to fail when B fails!

ABCP Growth: Jan 2001 - Feb 2009

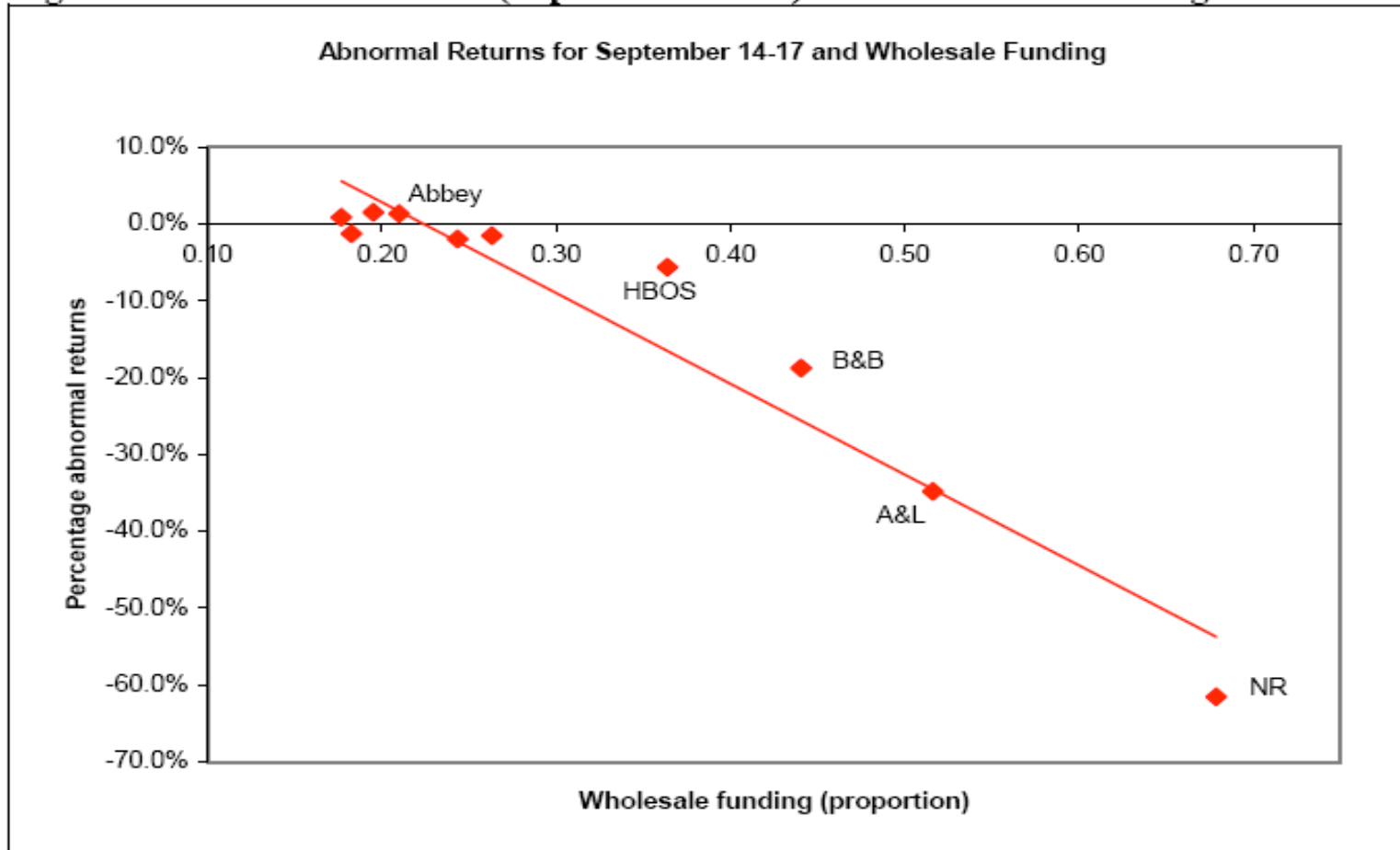


ABCP spread as the crisis broke out...



Northern Rock contagion/(Yorulmazer, 2008)

Figure 2: Abnormal Returns (September 14-17) and Wholesale Funding



Polling Question #2

What would be the effect of a rate rise on financial firms' and corporations' cost of financing?

- Catastrophic
- Tough but manageable for financially sound companies
- Negligible, as demand for credit is still weak

Capital versus Liquidity: The case of Bear Stearns



- Bear Stearns relied on day-to-day short-term financing through secured borrowing
- One would anticipate a well-capitalized institution to NOT face problems in borrowing, especially secured!
 - Beginning late Monday, March 10, 2008, and increasingly through the week, rumours spread about liquidity problems at Bear Stearns
 - Notwithstanding the high quality collateral, market counterparties became less willing to lend secured at customary terms

Capital at Bear Stearns

(Source: SEC Chairman's letter to BIS)



BSSC Net Capital (\$ billion)

	<u>Required</u>	<u>Excess</u>
• 31-Dec	1.26	3.38
• 31-Jan	1.30	2.92
• 14-Mar	1.27	>2.00 (estimated)

BS&Co. Net Capital (\$ billion)

	<u>Required</u>	<u>Excess</u>
• 31-Jan	0.56	2.71
• 14-Mar	0.58	>2.00 (estimated)

Holding Company Capital Ratio

- 31-Dec 13.7%
- 31-Jan 14.4%
- 29-Feb 13.5% (estimated)

Liquidity at Bear Stearns

Liquidity Pool (\$ billion)

- 31-Jan 8.4
- 4-Feb 12.8
- 5-Feb 15.8
- 6-Feb 17
- 7-Feb 16.1
- 22-Feb 15
- 23-Feb 15
- 24-Feb 15
- 25-Feb 18
- 26-Feb 19
- 27-Feb 19
- 28-Feb 19
- 29-Feb 19
- 1-Mar 19

Liquidity Pool (\$ billion)

- 2-Mar 19
- 3-Mar 20
- 4-Mar 20.1
- 5-Mar 21
- 6-Mar 21
- 7-Mar 18
- 8-Mar 18
- 9-Mar 18
- 10-Mar 18.1 (15.1 adjusted for customer protection rule)
- 11-Mar 11.5 (15.8 adjusted for customer protection rule)
- 12-Mar 12.4
- 13-Mar 2

(II)Liquidity at Bear Stearns

- *“...[U]ntil recently, short-term repos had always been regarded as virtually risk-free instruments and thus largely immune to the type of rollover or withdrawal risks associated with short-term unsecured obligations.*”

In March, rapidly unfolding events demonstrated that even repo markets could be severely disrupted when investors believe they might need to sell the underlying collateral in illiquid markets.

Such forced asset sales can set up a particularly adverse dynamic, in which further substantial price declines fan investor concerns about counterparty credit risk, which then feed back in the form of intensifying funding pressures.”

- Ben Bernanke’s remarks to the Risk Transfer Mechanisms and Financial Stability Workshop at the BIS, May 29, 2008

Which liquidity risk scenarios?

- *“In addition to capital, liquidity and liquidity risk management are of critical importance... CSEs have adopted funding procedures designed to ensure that the holding company has sufficient stand-alone liquidity and financial resources to meet its expected cash outflows in a stressed liquidity environment where access to unsecured funding is not available for a period of at least one year?”*

- Christopher Cox, Chairman, SEC, Letter to Basel Committee (2008)

- Also inability to borrow secured short-term (overnight)?

Liquidity risk management will take centre stage

- *“Recall Bagehot’s advice: ‘The time for economy and for accumulation is before. A good banker will have accumulated in ordinary times the reserve he is to make use of in extraordinary times’.*

In light of the recent experience, and following the recommendations of the President’s Working Group on Financial Markets (2008), the Federal Reserve and other supervisors are reviewing their policies and guidance regarding liquidity risk management to determine what improvements can be made.

In particular, future liquidity planning will have to take into account the possibility of a sudden loss of substantial amounts of secured financing.”

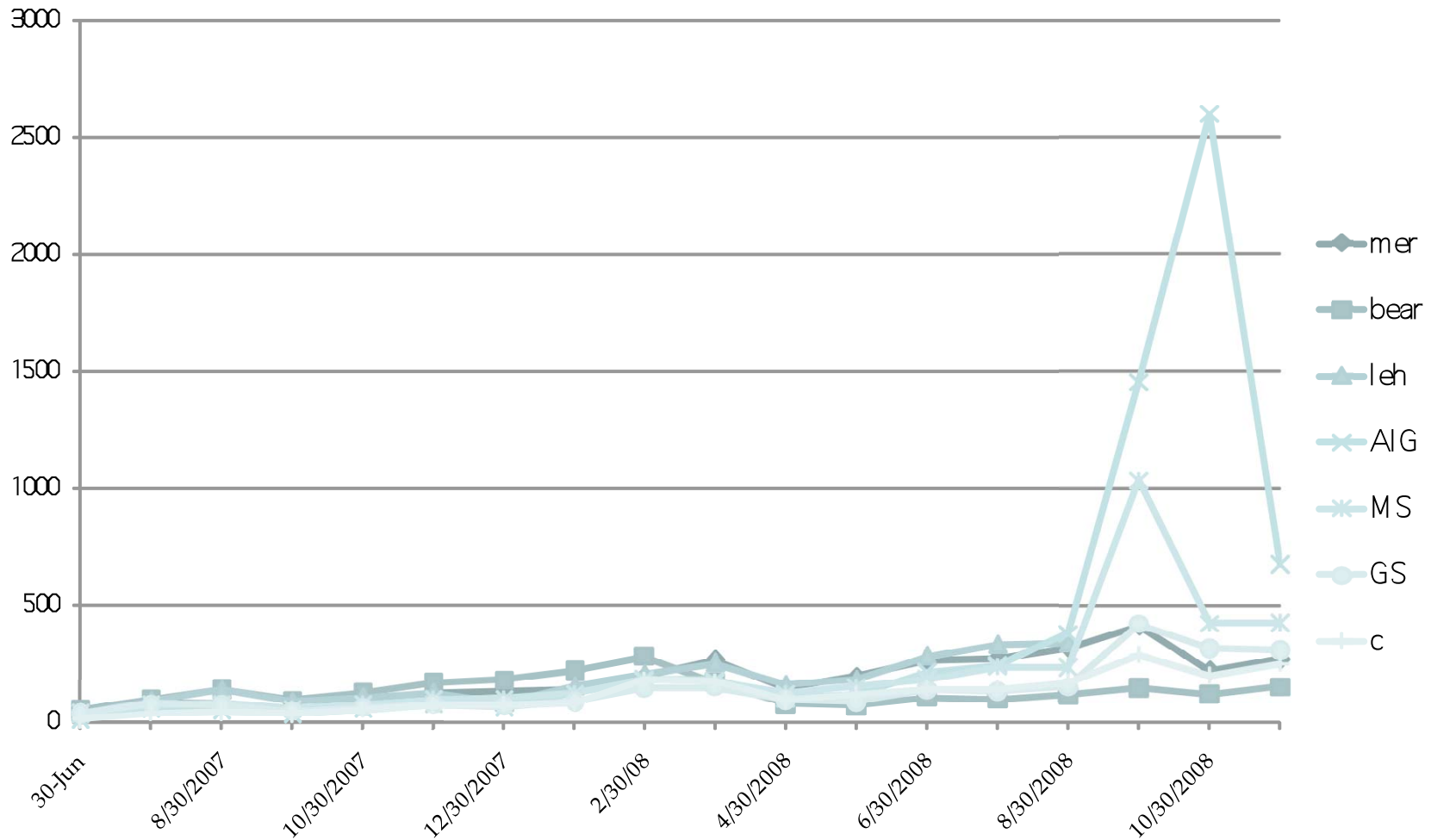
- Ben Bernanke’s remarks to the BIS, May 29, 2008

Crowded trades and liquidity risk (Lehman April 08)

(in bln USD)

	Loans	HELO C	Agency MBS	Non-Agency AAA	CDO Subord	Non CDO Subord	Total	
Banks & Thrifts	2,020	869	852	383	90		4,212	39%
GSEs & FHLB	444		741	308			1,493	14%
Brokers/dealers			49	100	130	24	303	3%
Financial Guarantors		62			100		162	2%
Insurance Companies			856	125	65	24	1,070	10%
Overseas			689	413	45	24	1,172	11%
Other	461	185	1,175	307	46	49	2,268	21%
Total	2,925	1,116	4,362	1,636	476	121	10,680	
	27%	10%	41%	15%	4%	1%		

CDS SPREADS



Polling Question #3

How can firms best manage the risk of an interest rate hike in the near future?

- Prudent use of interest rate derivatives
- Match interest rate terms of their funding with credit provided to their customers
- Greater use of non-interest bearing financing such as supplier credit

Proposed reforms to the financial sector

- In one way or the other, financial sector's aggregate or systemic risk exposures will be "taxed"
 - Systemic risk fee (Obama proposal)
 - Separation of trading activities from safety net (Volcker rule)
 - Higher capital and liquidity requirements
 - Contingent capital or debt for equity swaps
 - Resolution mechanism or wind-down plans or "living wills"
 - Standardization, collateralization and transparency in OTC derivatives
- All these measures will restrict leverage extension from banks to the corporate sector and households
 - Especially so for industries that are cyclical (high beta), Housing loans and mortgages will remain tight, and Contingent liabilities like lines of credit
 - Corporate costs of hedging using derivatives and LC likely to go up

Conclusion

- Firms and households may have to save more than they have been used to
 - Will restrict growth but growth may end up being more robust this way
- “Cash is king” has some ring of truth to it
- Aggregate risk affects firms’ choice between cash and other liquidity management options such as cash flows, market financing and bank/wholesale financing
- Firms should worry about
 - Systemic or aggregate risk of their cash flows and financing sources
 - Counterparty risk in their financing arrangements
 - Whether counterparty risk exposure is “wrong way” or correlated with systemic risk



Thank you for your participation in this webinar

Your comments and feedback are greatly appreciated