

Risk management, the global financial crisis and regulatory reform: Lessons for Asia and research agenda

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Roadmap

- Some evidence on the crisis
 - Incentives, governance, and regulation
- Risk management in financial institutions and the crisis
- Regulatory reform after the crisis
 - Dodd-Frank, Basel 2.5, Basel III, and more
 - Unforeseen consequences
 - Is there a better way?
- Research agenda

Some evidence on the crisis

What failed and why did it matter?

- Blinder: “Give smart people go-for-broke incentives and they will go broke. Duh.”
- FCIC: “...dramatic failures of corporate governance and risk management at many systemically important institutions were a key cause of this crisis.”
- Rajan: “Financial firms were taking tail risk.”
- Acharya, Schnabl, and Suarez: “...banks increasingly devised securitization methods that allowed them to concentrate risks on their balance sheets which eventually led to the largest banking crisis since the Great Depression.”

Evidence from Beltratti/Stulz Journal of Financial Economics

- Look at how variables proxying for factors that caused or aggravated the crisis are related to performance of banks during the crisis
- Start from the 1,648 financial institutions on Bankscope with total assets in excess of \$10bn as of 2006
- Keep banks with data on the characteristics we use and with returns on Datastream as of beginning of July 2007
- Find 442 banks; focus mostly on 164 banks with assets in excess of \$50 bn (32 countries)

Characteristics of banks that performed better during the crisis

- More equity (tier 1 capital ratio) in 2006: 9.6% vs 8.6%
- More deposits: 69.7% versus 50.1%
- Less funding fragility
- Less non-interest income: 34.0% versus 43.6%
- Lower distance to default!
- More idiosyncratic volatility!

Regressions with country fixed effects

- Dependent variable: Buy-and-hold return from July 2007 to December 2008
- Positive impact of Tier 1 capital
- Performance increases with deposits/assets
- Loans to assets is insignificant
- Fragility is highly significant
- Performance is worse for banks that did better in 2006
- Banks with more shareholder-friendly boards performed worse

Regulation and crisis performance

- Use 2006 version of indices developed by Levine and co-authors
- *Official*: index of power of the commercial bank supervisory agency (e.g. meet with auditors, intervene in a bank...)
- *Capital*: index of regulatory oversight of bank capital (e.g. how tight is the definition of capital)
- *Restrict*: index of regulatory restriction on the activities of banks (e.g. own non-financial corporations, securities trading...)
- *Independence*: index of independence of supervisory authority
- Only *Restrict* is significant. Banks did better in countries where restrictions on their activities were stronger

Summary

- Capital positively related to performance
- Pre-crisis risk measures do not forecast performance
- More traditional banks fared better
- Regulation mattered only to the extent that it made banks more traditional
- Banks with boards more aligned with shareholder interests performed worse

Governance and incentives

- Governance experts argue that CEO incentives are better when CEOs own more shares
- How did that work out?

Largest equity portfolios

1. James Cayne (Bear Stearns, \$1,062 million)
2. Richard Fuld (Lehman Brothers, \$911.5 million)
3. Stan O'Neal (Merrill Lynch, \$359 million)
4. Angelo Mozilo (Countrywide Financial, \$285 million)
5. Robert J. Glickman (Corus Bankshares, 281.1 million)

Bank performance and ownership

	Stock returns	ROE
Bonus/Salary	0.014	0.09
Ownership (\$)	-0.079**	-0.073**
Equity risk (\$)	0.030	0.022

Fahlenbrach and Stulz, 2011 JFE

Why did banks hold highly-rated tranches of securitizations?

- Paper with Erel and Nadauld, RFS
- We focus on publicly traded U.S. BHCs as of December 31, 2006
- For the typical bank, holdings of highly-rated tranches (AAA and AA) were economically trivial
 - Median holdings over assets of 0.15% in 2006
 - But, holdings are skewed as mean is 1.3% in 2006
- Big differences across big three: Citi, 5.75%, BAC, 1.96%, JPM, 1.09%
- Banks with the highest holdings were not riskier before the crisis but they had worse performance during the crisis

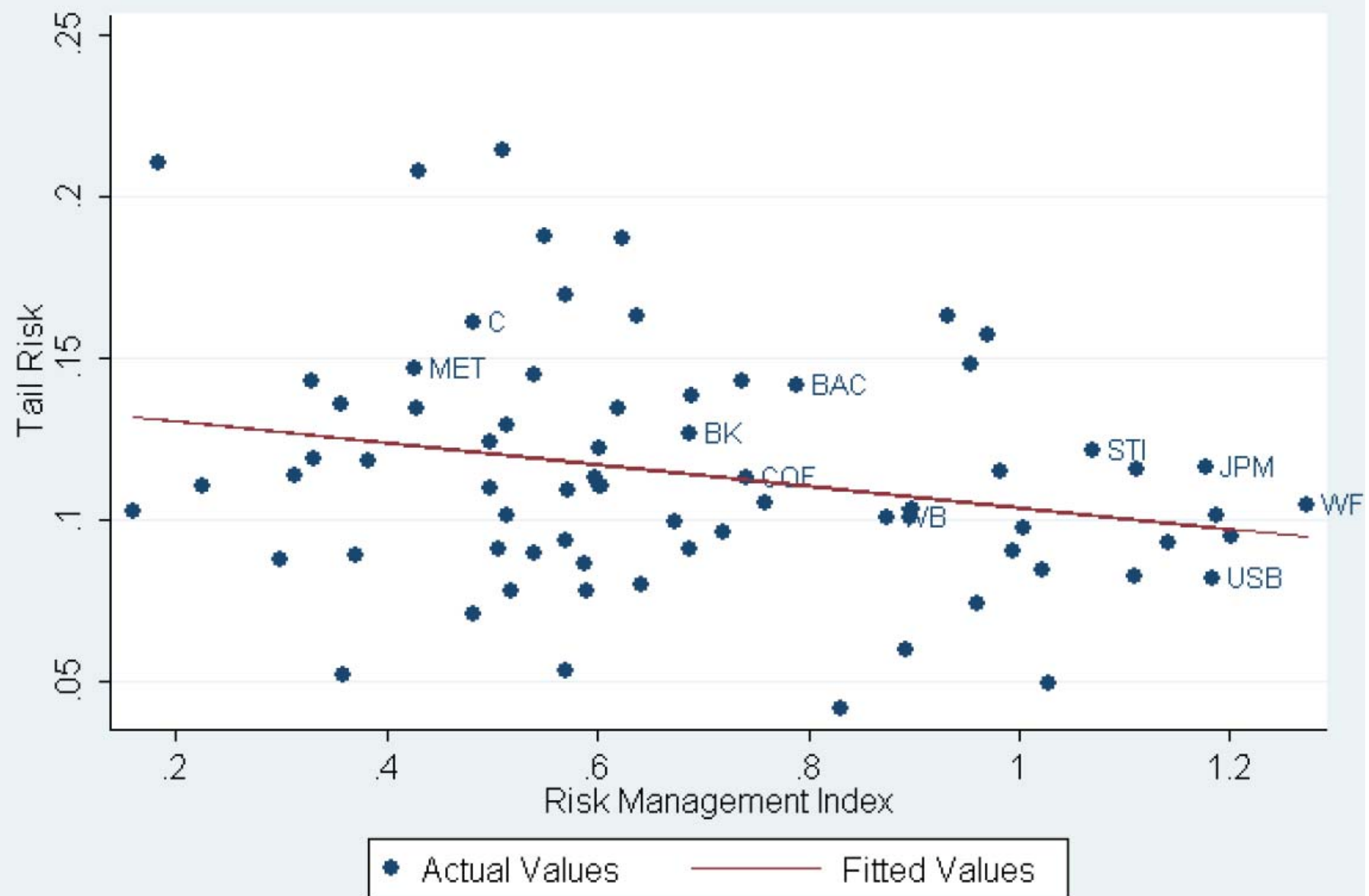
Results

- Securitization-active banks held more highly-rated tranches
 - Evidence consistent with “skin in the game” arguments
- Holdings increased with bank assets, but the largest banks did not have higher percentage holdings
 - Inconsistent with a simple “too-big-to-fail” incentives of banks as an explanation
- No proxy for incentives is significant
 - Governance index, trading, excess comp., bonus/salary, risk management index

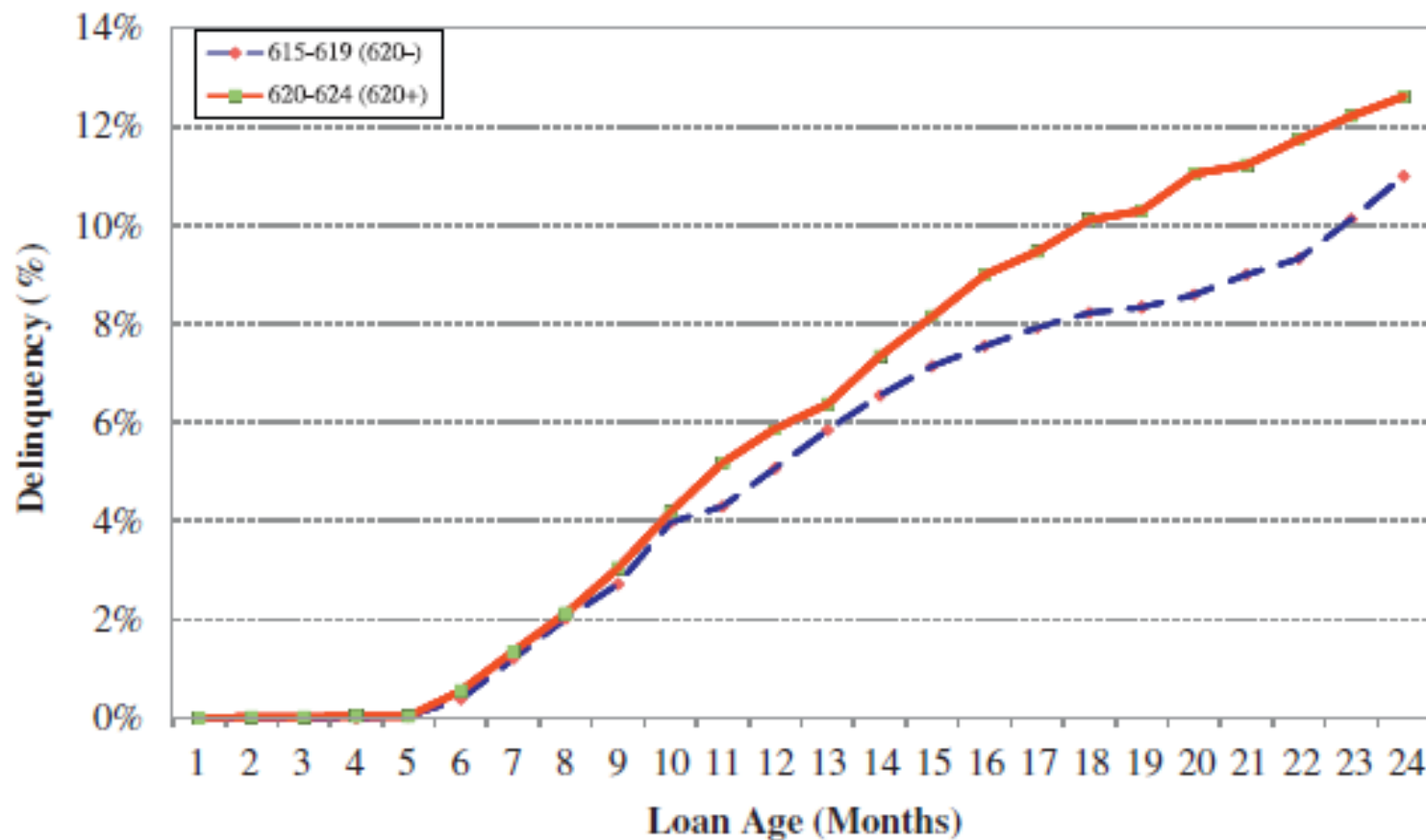
Risk management

Risk management and crisis

- Ellul and Yerramili, JF
- Construct risk management index based on:
 - CRO centrality
 - Is there a CRO?
 - Is CRO executive?
 - Is CRO top five in compensation?
 - Does risk committee meet more than audit?
 - Does risk committee have somebody with experience?



Delinquency and FICO paradox



Red line is for FICO 620-624/Dotted line is for FICO 615/619

Source is Keys, Mukherjee, Seru, and Vig

FICO paradox and risk management

- A possible explanation for paradox is that banks underwrite more poorly loans to FICO above 620 because they can securitize
- Risk management mitigates the moral hazard
- More highly paid CRO relative to the executive team makes the paradox disappear.

Risk management and risk taking

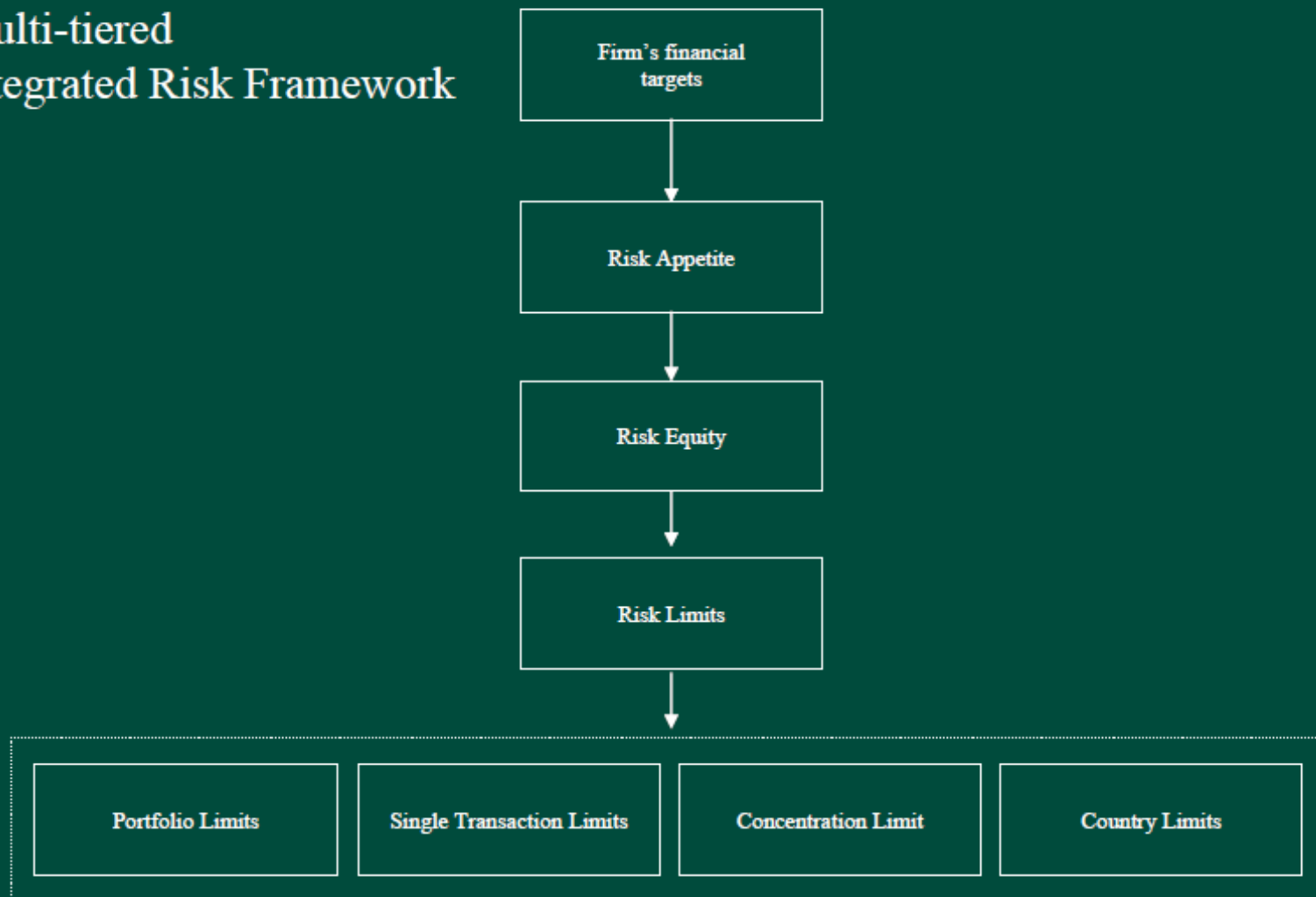
- Risk management is not minimizing risk: There is an optimal level of risk for shareholders
- Too little risk means that the bank is not taking full advantage of its capabilities: It is turning down positive NPV projects
- Too much risk means that the bank is losing business because it is too risky

Good risk management: A misconception

- With good risk management, there will be material losses
 - Downside of risk taking that is value creating
 - It is not feasible and not economically sensible to eliminate all bad risks
 - It is not feasible and not economically sensible to monitor risks in such a way that material losses are not possible
- Good risk management is about insuring that the firm has the optimal amount of risk

Risk Management Practices: An Integrated Framework

- Multi-tiered
- Integrated Risk Framework



Role of risk management

- Suppose the relation between risk and value is concave: there is a risk level that maximizes shareholder wealth
- The CEO would pick that level to maximize bank value absent agency problems if she could do so costlessly
- In a real world bank, there is a coordination problem: risk taking is the result of the activities of the employees of the bank
- The CEO cannot pick the risk without a coordination device
- The risk management organization is that coordination device

Risk management's coordination role

- To perform its coordination role, risk management is required to identify, measure, aggregate, and monitor risks within the firm
- Though it is called risk management, it is a misnomer: the CEO, not the CRO, manages the risk of the firm
- With decentralized risk taking, four problems have to be addressed:
 - Agency problem
 - Bad risk problem
 - Measurement problem
 - Risk governance problem

Risk measurement

- The amount of risk is firm-wide
- Aggregation problem
- Technology to measure firm-wide risk is underdeveloped
- Model risk is underappreciated
- Business risk is often ignored
- Basel #whatever ignores business risks and ALM risks

VaR exceptions

4. Classification of banks according to VAR exceptions

Zone	Bank	Confidence interval	Number of realised exceptions in stressed period	Harmonised number of exceptions occurred during stressed period	Zone
US	Lehman Brothers	95%	13	2-3	Green [0-4] exceptions
US	Goldman Sachs	95%	13	2-3	
US	Morgan Stanley	95%	18	4-5	
Europe	BNP Paribas	99%	7	7	Yellow [5-9] exceptions
US	JP Morgan	99%	10	10	Red ≥10 exceptions
US	Bear Stearns	95%	34	12	
Europe	Credit Suisse	99%	25	25	
Europe	Société Générale	99%	29	29	
Europe	Deutsche Bank	99%	35	35	
Europe	UBS	99%	50	50	

Source: annual reports, Calculations: Banque de France/DSF

Risk Management Practices: An Integrated Framework

Risk Limits

■ Risk Appetite Limits

- The overall limit is driven by Risk Appetite which is approved by the Executive Committee.
- Limits are set by Risk Management in conjunction with the business heads.
- Limits are cascaded down to the divisions and businesses.

■ Credit Limits

- All counterparties are given internal ratings.
- Every counterparty has a limit which is subdivided into product limits
 - no diversification benefit is given to any counterparty across products
- The largest counterparties by industry, region and product are reviewed on a quarterly basis.
- All counterparties rated below “A” are formally reviewed on an annual basis

Limits of limits

- We don't have a theory of limits
- Limits can't control risks that are not observed and are not measured by risk management
- Limits can't control risks where risk management is not allowed to put limits
- Banks don't put limits on strategic risks

Example

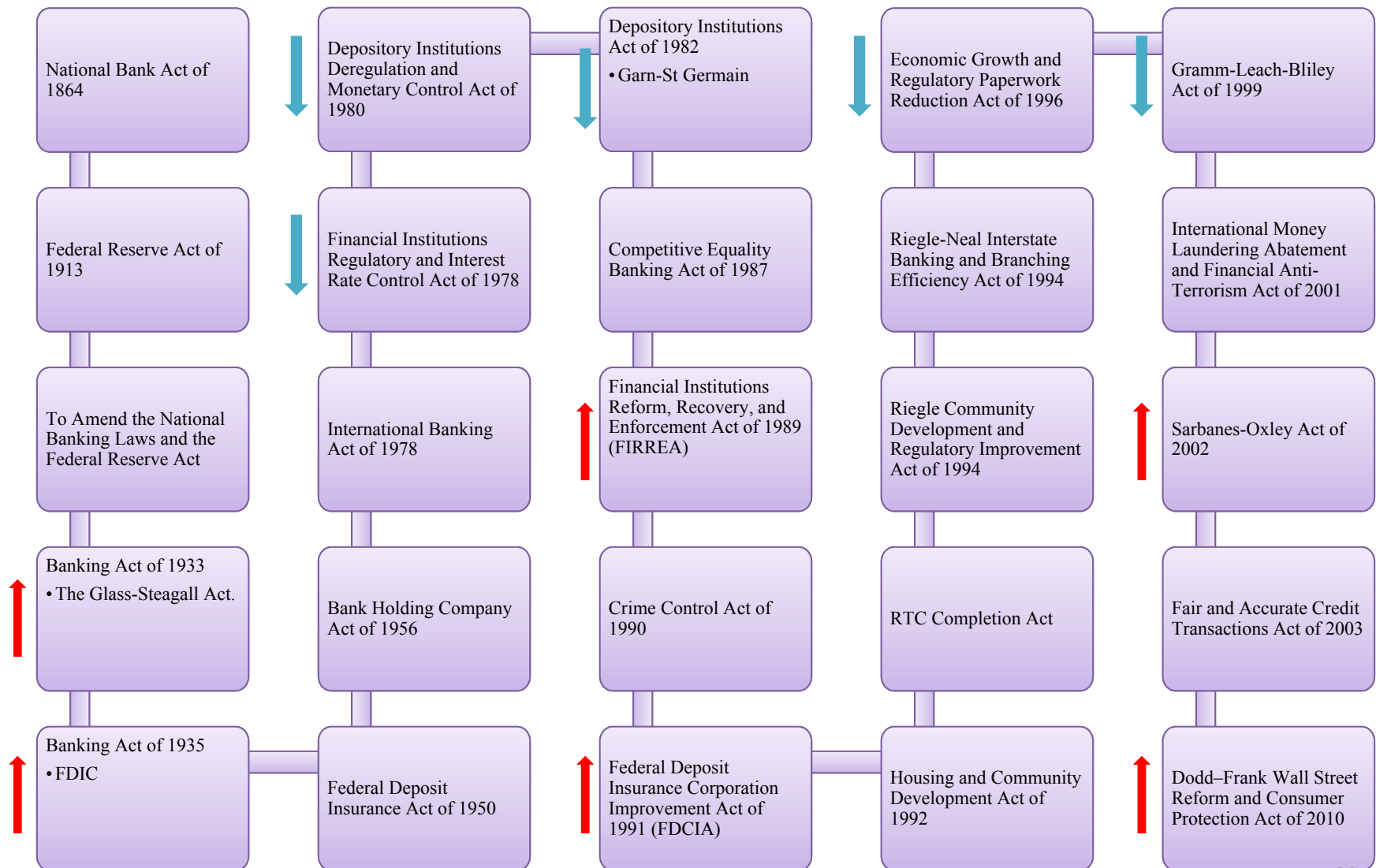
- October 2007: a consortium led by RBS took over ABN Amro in a deal valued \$98.5 billion
- Succeeded by outbidding Barclays
- Investment banker: “There is stuff in here we can’t even value.” Goodwin: “Stop being such a bean counter.”
- “RBS credit traders (...) were horrified at what they found.”

Limits are not enough

- Others tools to make risk management more effective:
 - Risk governance
 - Incentives
 - Culture

Regulatory reform

Regulation follows crises



THE SQUAM LAKE REPORT

FIXING THE FINANCIAL SYSTEM

Kenneth R. French • Martin N. Baily • John Y. Campbell
John H. Cochrane • Douglas W. Diamond • Darrell Duffie
Anil K Kashyap • Frederic S. Mishkin • Raghuram G. Rajan
David S. Scharfstein • Robert J. Shiller • Hyun Song Shin
Matthew J. Slaughter • Jeremy C. Stein • René M. Stulz

Basic Principles:

- 1) Identify specific problems that motivate regulation
- 2) Worry about unintended consequences
- 3) Consider **systemic** impact of regulations
- 4) Force firms to bear the full costs of their actions

Capital Requirements

- Focus on macro-prudential goal of protecting the system from fire-sale and credit-crunch spillovers
 - Greater capital requirements for large banks and banks with less liquid assets
- Heavy use of short-term debt causes system fragility
 - Capital requirements should be higher with more short-term debt financing
- Higher capital and liquidity requirements will create strong pressure for activities to migrate out of regulated banking sector

U.S. Basel III: Higher Capital Ratios

Leverage Capital Requirements

U.S. Leverage Ratio: Tier 1 capital to average total consolidated assets (minus amounts deducted from Tier 1 capital) must be at least 4%. Applies to all U.S. banking organizations.

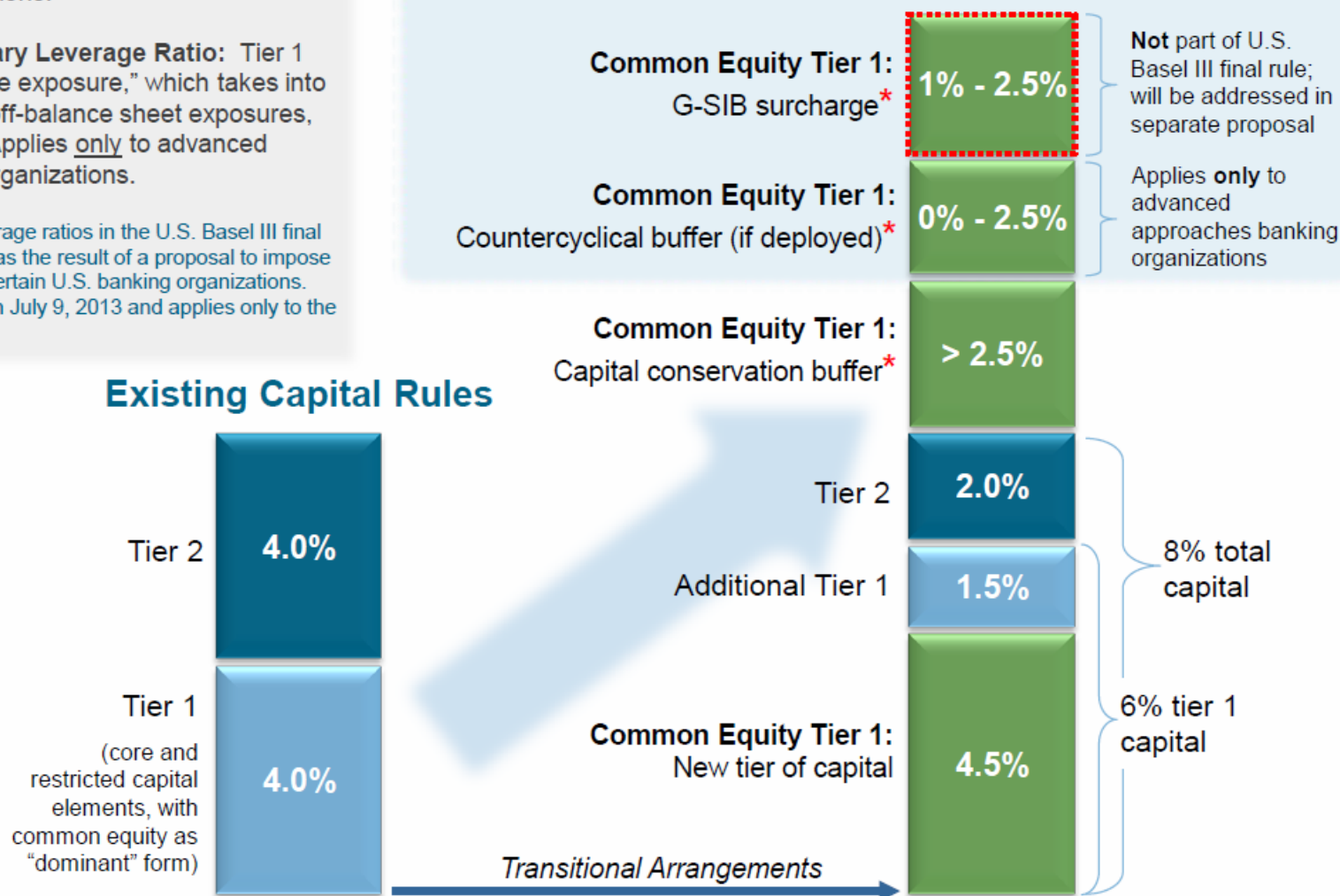
Basel III Supplementary Leverage Ratio: Tier 1 capital to "total leverage exposure," which takes into account both on- and off-balance sheet exposures, must be at least 3%. Applies only to advanced approaches banking organizations.

Future changes: The leverage ratios in the U.S. Basel III final rule may ultimately change as the result of a proposal to impose a higher leverage ratio on certain U.S. banking organizations. This proposal was issued on July 9, 2013 and applies only to the eight U.S. G-SIBs.

Risk-Based Capital Requirements

U.S. Basel III Final Rule

G-SIB surcharge and countercyclical buffer only apply to certain large, internationally active U.S. banking organizations



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3 Product-specific RoEs show highest impact on structured products, especially credit and rates

RoE (effect), Percent (Percentage points)

X Delta, percent
 Most significant impact

Asset class	Pre regulation	B II.5	Basel III/Other					Post regulation	
		1	2	8a	8b	3	6/7		
		Mkt risk	CCR	RWA red.	Rev. impact	Cap. / Lev	Lqd. / Fund.		
1 FX	30	-8	0	0	0	-4	-2	16	-46
2a Rates - Flow	19	-6	-5	4	-1	-2	-1	8	-59
2b Rates - Strctrd	15	-4	-6	1	-1	-1	-1	4	-77
3a Credit - Flow	18	-8	0	0	-1	-1	-1	6	-65
3b Credit - Strctrd	17	-9	-2	1	-1	-1	-1	3	-83
4 Commodities	20	-6	-3	1	-1	-2	-2	8	-61
5 Cash Equities	25	-5	0	0	0	-3	-2	15	-39
6a EQD - Flow	25	-8	-1	2	-5	-2	-2	9	-65
6b EQD - Strctrd	27	-10	-4	1	-1	-2	-2	9	-68
7 Prime Svcs	15		0	0	0	-6	-1	8	-46
8 Prop Trading	35	-22	-1	0	-1	-2	-2	7	-80
Total	20	-7	-3	2	-1	-2	-1	7	-64

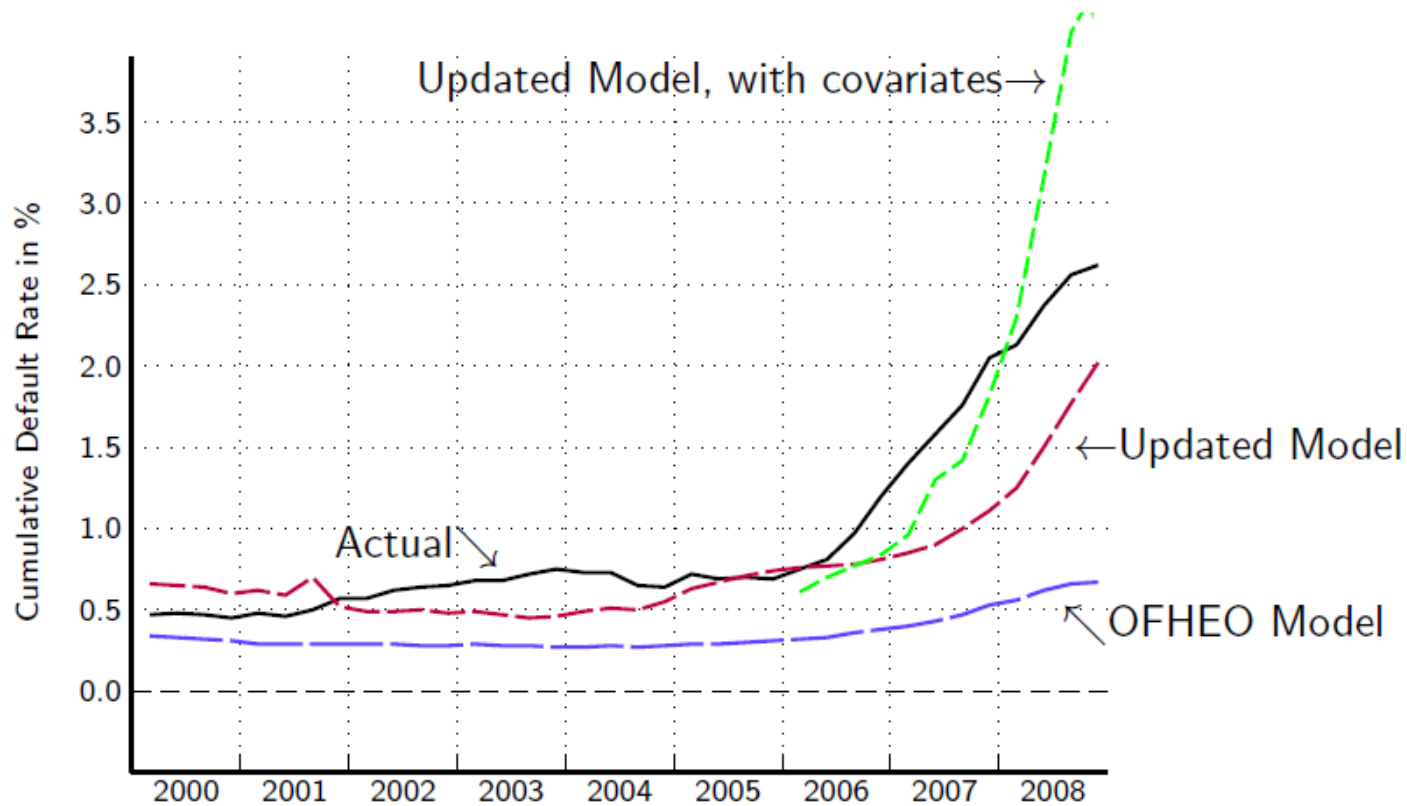
Borrowed from McKinsey/Toni Santomero

Stress tests

- One important evolution is that capital requirements are complemented by a variety of stress tests
- Stress tests have several problems:
 - Lack of transparency of models
 - Time and resource consuming
 - Assumptions can become politicized
 - Difficulty in planning for financial institutions

Example: Fannie and Freddie

2-Year Horizon



Source: The failure of supervisory stress testing by Frame, Gerardi, and Willen

How the world has changed

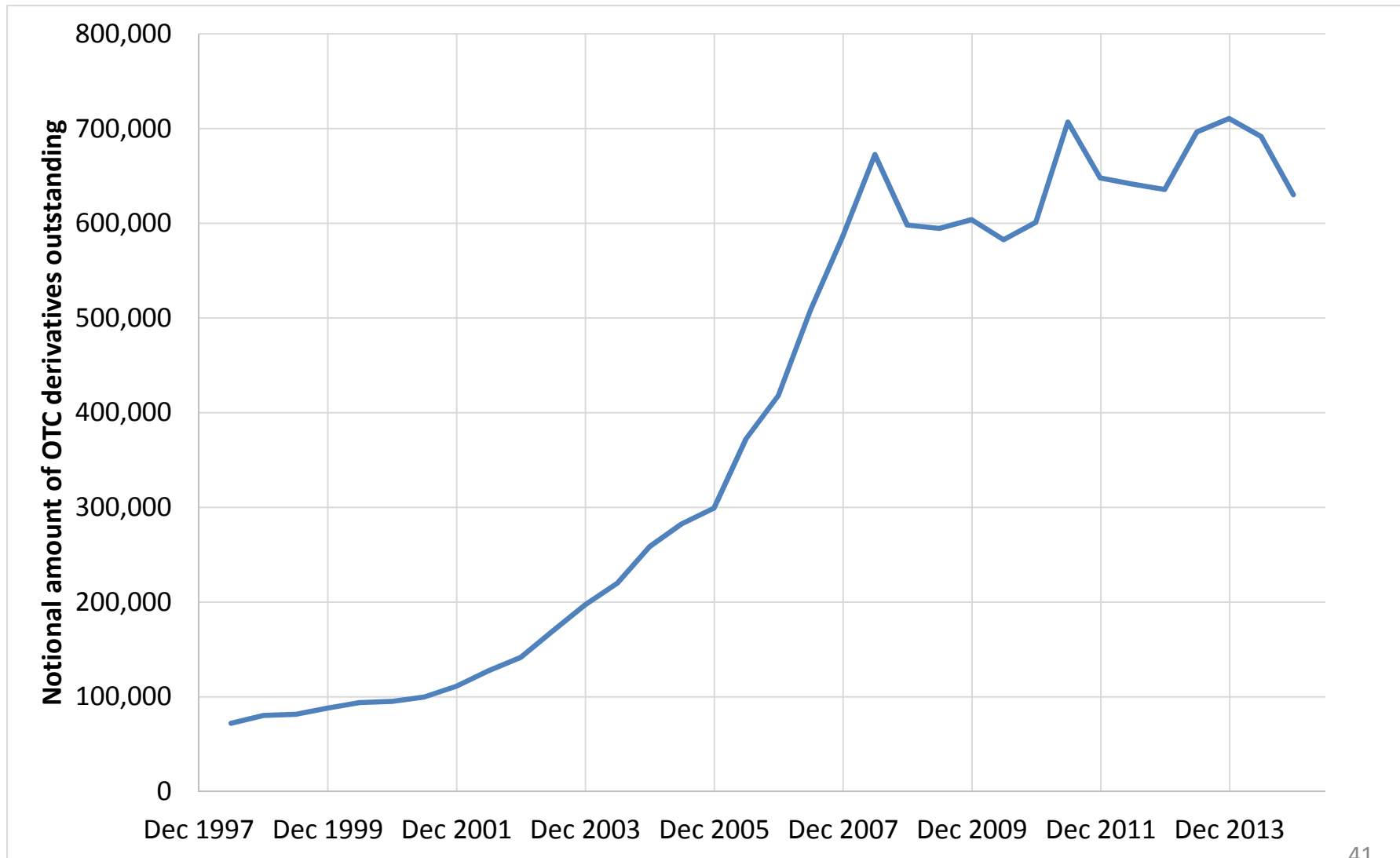
- “Deutsche Bank CRO: derivatives becoming loss leader”
- SLR caps netting and puts 5% add-on on non-cleared CDS, so firms are exiting the business – DB, CS
- More generally, dealer inventories of credit securities were \$235 billion in October 2007; they are \$60 billion now

October 15, 2014 Treasury Spike

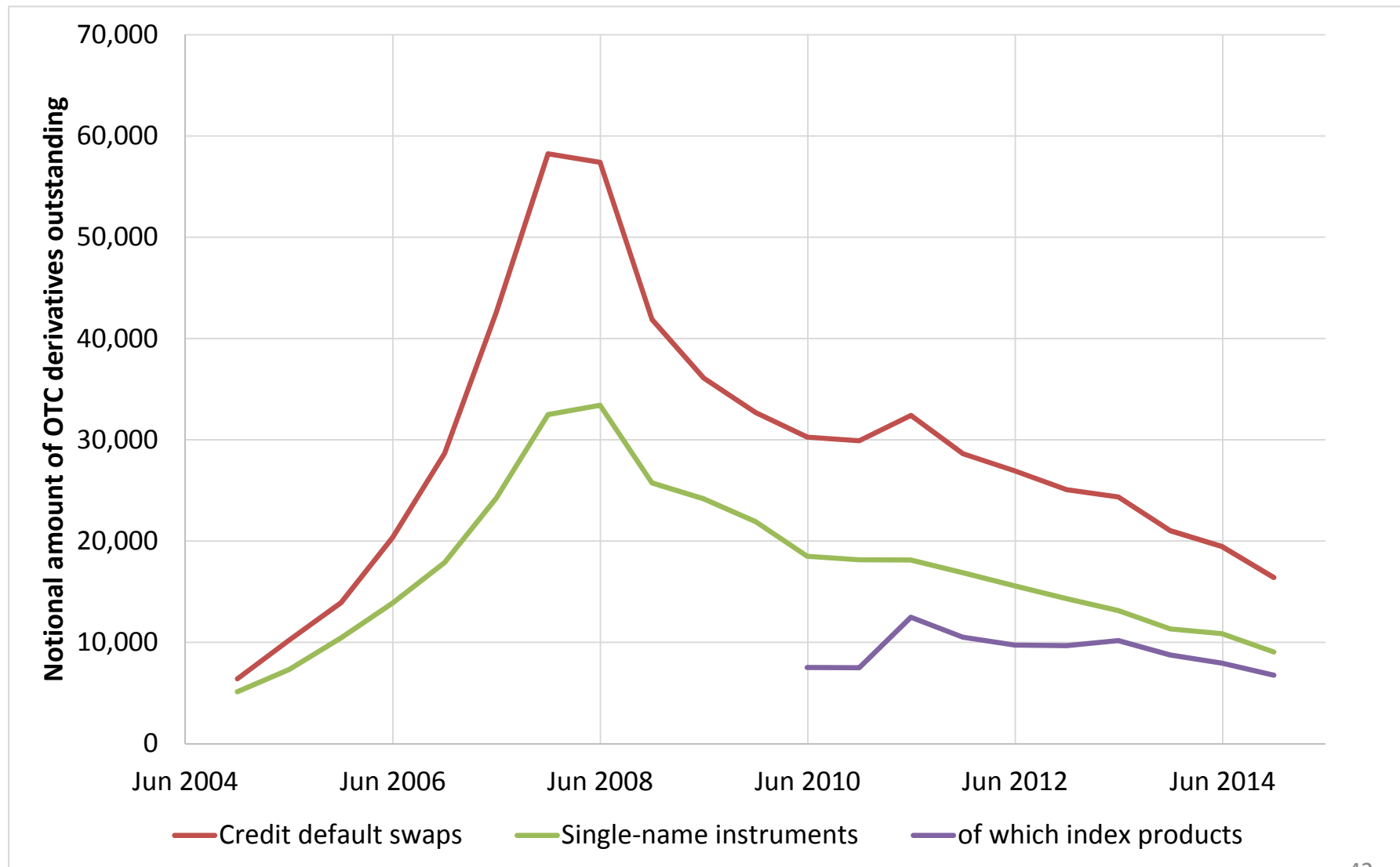
On Oct. 15, the yield on the 10-year Treasury note tumbled to its biggest one-day decline since 2009.



Derivatives Growth Stalled



Credit-default swaps



Where are we?

- Will banks be able to perform their role in the new financial system?
- Where should regulatory intervention stop?
- Is TBTF worse than before?
- Real estate was at the core of the crisis, but nothing has been done in the U.S.

Risk Management as foundation for policy

- “We don’t know we have a bubble until it has popped”
- This has been the wrong approach.
- Right approach: What is the probability it is a bubble and what are the future costs if it is?

Research agenda

Research issues

- What are the determinants of the size of the financial sector?
- How does size and composition of financial sector affect growth and risk?
- What are the dynamics of liquidity?
- How to devise more robust risk measures for capital requirements?
- How to assess firm-wide risk management and risk measures?
- How important is moral hazard for banks?
- How important is regulatory and policymaker model risk?

Conclusion

- Support for popular crisis theories is weak
- Bad expectations played more of a role than modern finance allows for
- Risk management can be done better, but it will not necessarily make the world safer
- Regulation reform should engineer the financial system for growth, not for gridlock
- Can't make progress without research