Implicit guarantees and market discipline: Has anything changed over the financial crisis?

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Introduction

- The importance of *market discipline* has been stressed extensively
  - Introduction of market discipline as Pillar 3 in Basel II
- However, the *too-systemic-to-fail* doctrine is a strong antagonist of market discipline
  - Large banks benefit from a cost advantage in the refinancing rate
  - In a systemic crisis, even small banks receive a bailout subsidy

This Paper

- Analyze the importance of different rating information as determinants of bank CDS spreads from 2005 until 2014
- Identify the long-run effect of *implicit bailout guarantees*
- Identify the long-run effect of *market discipline*
- Analyze the *relative importance* of implicit government guarantees and market discipline over time, especially over the different stages of the financial crisis

Main Results

- When controlling for banks' individual strength, external support has a *negative* effect on banks' CDS spreads
  $\Rightarrow$ Evidence for a positive value of the contingency insurance for *governmental guarantees*
- When controlling for banks' bailout probability, individual creditworthiness has a *negative* effect on banks' CDS spreads
  $\Rightarrow$ Evidence for *market discipline*
- Disciplinary effect *diminishes* with an increasing bailout probability
- Effect of the *intrinsic solvency* increases over time
- *Implicit government insurance* becomes less valuable

Related Literature

Estimating the value of bailout guarantees

- **Contingent claim approach**
  - E.g. Schweikhard and Tsesmelidakis (2012), Hett and Schmidt (2013)
  - Compare actual CDS-spread with counterfactual CDS, derived from equity prices
  - Result: Significant relationship between the systemic relevance of an institution and the difference between actual and counterfactual CDS
  - Approach is very sensitive towards assumptions for calculating the counterfactual fair CDS

Related Literature

Estimating the value of bailout guarantees

- **Bond yield approach**
  - E.g. Acharya, Anginer, and Warburton (2014), Santos (2014)
  - Compare bond yields of systemically important banks and non-systemically important banks
  - Result: Significant sensitivity of bond yield spreads to risk for most financial institutions, but not for the largest ones
  - Approach neglects the possibility of genuine economies of scale

Related Literature

Estimating the value of bailout guarantees

- **Rating approach**
  - E.g. Ueda and Weder di Mauro (2013), Schich and Lindh (2012)
  - Estimate the effect of government support on banks' long-term rating
  - Result: Significant positive value of a bailout guarantee
  - These paper neglects the time dimension and just analyze a snapshot of ratings at two points in time

CDS Spreads and Bail-out Expectations

- Bank CDS are insurance contracts against bank default or other credit events $\Rightarrow$ CDS spreads are a function of the *expected losses on bank liabilities*
- Expected losses are a function of the (expected) *probability of default* (PD) and *loss given default* (LGD):

$$\textit{Expected losses} \;=\; \textit{PD} \cdot \textit{LGD}$$

- The PD of a bank is determined by the *fundamental PD* and the *probability of a bail-out* (given default):

$$\textit{PD} \;= (1 - \textit{bail-out probability}\;) \cdot \textit{fundamental PD}$$

- Hence, CDS spreads are a function of the (expected) *fundamental PD*, the *bail-out probability*, and the *LGD*

Measuring Bailout Probability: Support Rating

- Reflects the view of Fitch Ratings on the likelihood that a financial institution will receive external support, if necessary
- Captures not only Fitch Ratings view on the willingness that support is provided, but also on the ability to bailout the bank
- Support Ratings are published on a five-point scale:
  - 1 - "An institution with an extreme high likelihood for receiving external support"
  - 5 - "An institution for which there is a possibility of external support, but it cannot be relied upon"
- In the empirical analysis, the measure is multiplied by -1, such that higher values indicate a higher probability of support

Measuring Bailout Probability: Support Rating

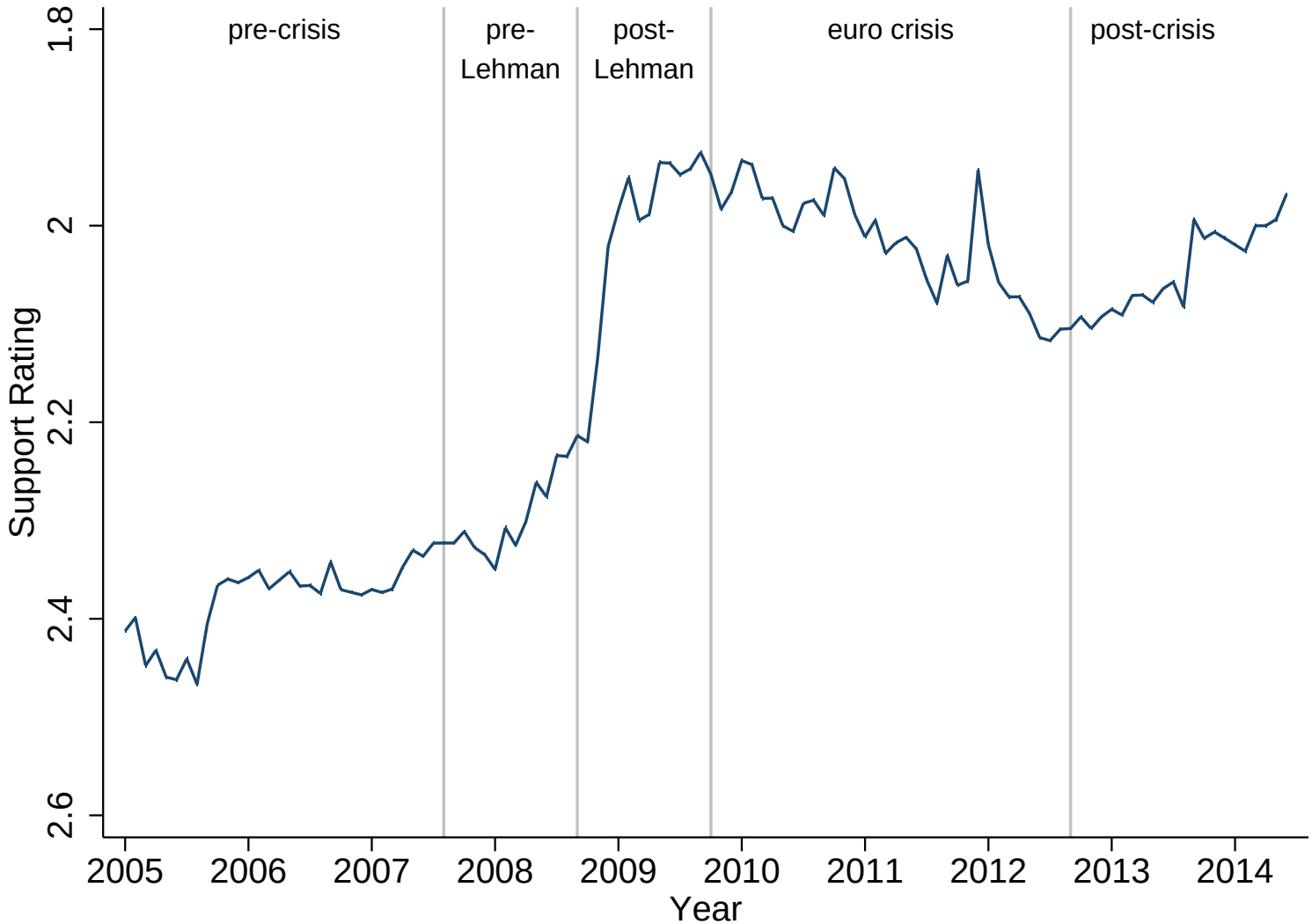

Illustration of the average Support Rating

Measuring Fundamental PD: Viability Rating

- Reflects the view of Fitch Ratings on the likelihood that a financial institution will fail (default or require support)
- Captures Fitch Ratings view on the intrinsic standalone creditworthiness of a financial institution
- Viability Ratings are published on a scale virtually identical to the classical *AAA*-scale, and translated to a numerical scale from 1 to 10:
  - aaa (10) - "Highest fundamental credit quality"
  - f (1) - "Failure"

Measuring Fundamental PD: Viability Rating

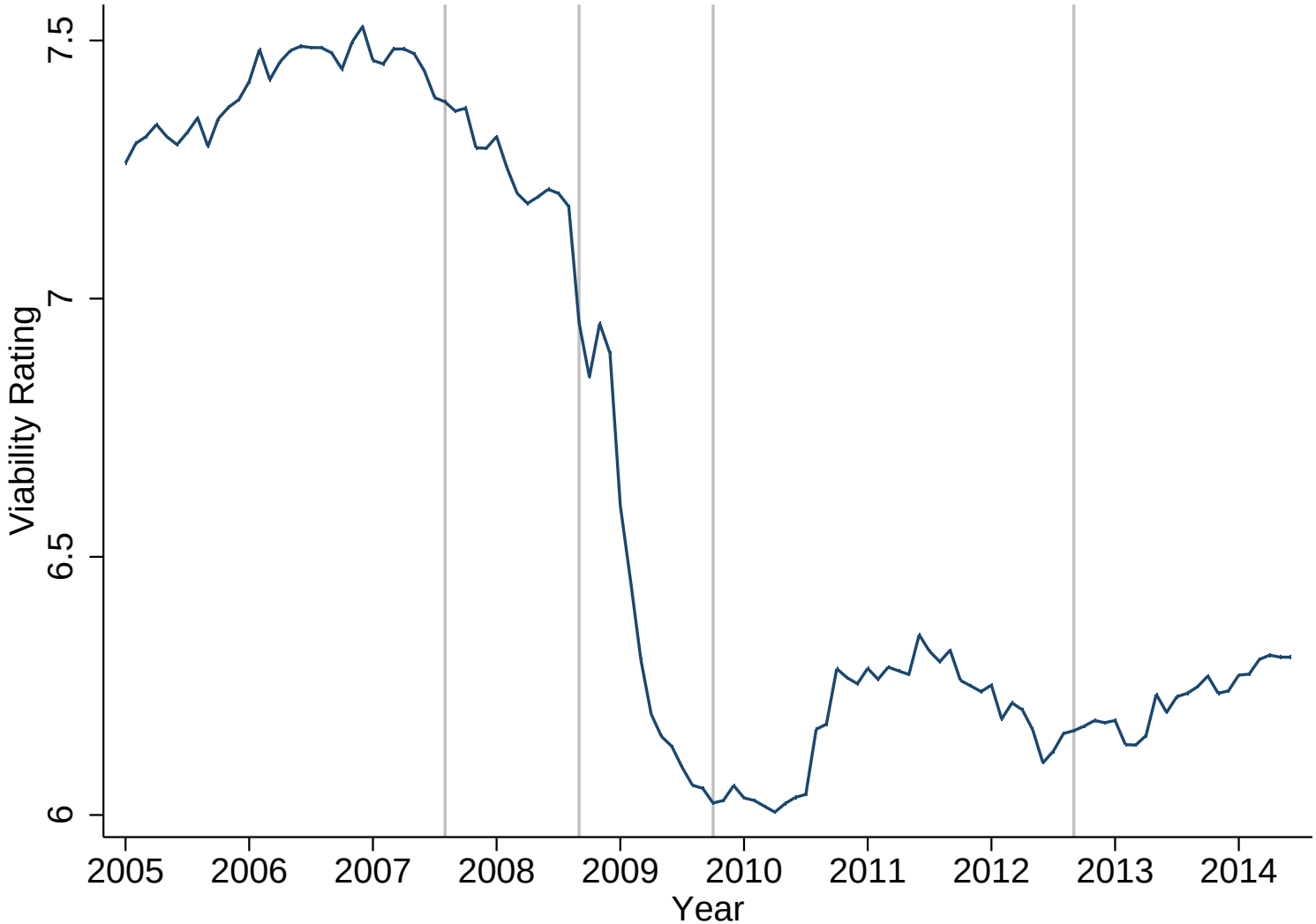

Illustration of the average Viability Rating

Hypothesis 1: Too Systemic To Fail (TSTF)

- Banks with a higher Support Rating are described to be more likely rescued by the government
  $\Rightarrow$ Systemic banks have a higher support rating
- This implicit bailout guarantee provides an insurance of debt holders against default
  $\Rightarrow$ Systemic banks have a lower expected PD

Hypothesis (Too Systemic to Fail)

Ceteris paribus, CDS spreads are lower for banks with a higher Support Rating.

Hypothesis 2: Market Discipline

- Banks with a low Viability Rating are described to have a risky business model
  $\Rightarrow$ Banks that take high risks have a higher fundamental probability of default
- Risk-taking should be punished by the market with a higher risk premium

Hypothesis (Market Discipline)

Ceteris paribus, CDS spreads are lower for banks with a better Viability Rating.

Hypothesis 3: TSTF and Market Discipline

- The value of a governmental insurance should depend on the fundamental default probability of the institution
- The implicit guarantee has a large value for banks with a poor intrinsic financial strength
- Similarly, the fundamental probability of default should matter most if a bailout is rather unlikely
  $\Rightarrow$ Heterogeneous TSTF- and market disciplinary effects

Hypothesis (TSTF and Market Discipline)

The effect of Viability Ratings on CDS spreads decreases in the probability of support.

Hypothesis 4: Wake-Up Call

- In the pre-crisis period, banks were regarded as safe and market discipline was weak
- If the financial crisis has served as a wake-up call, investors should punish excessive risk-taking with higher risk-premia
  $\Rightarrow$ The effect of Viability Ratings on CDS should vary over different periods of the financial crisis

Hypothesis (Wake-Up Call)

The effect of Viability Ratings on CDS spreads is stronger in the post-crisis period than in the pre-crisis period.

Data

- Daily CDS spreads from *markit* (senior unsecured CDS with maturity 5 years on debt denoted in USD or euro)
  - Winsorized at 1/99%
- Bank specific rating information from *Fitch Ratings*
  - Assumption: ratings are valid until it is withdrawn or replaced by a new one
- Period: January 2005 until June 2014, monthly frequency
- All banks from European countries, OECD countries, and from countries with a significant banking sector (one bank in the list of top 100 largest banks in terms of total assets)

Empirical Model

$$CDS_{i,t} = \alpha + \beta \cdot Support_{i,t} + \gamma \cdot Viability_{i,t} + \delta \cdot Support_{i,t} \cdot Viability_{i,t} + \mu_i + \nu_{t|Euro} + \rho_{t|USD} + u_{i,t}.$$

where

- *Support* measures the probability of external support (Hypothesis 1)
- *Viability* captures the bank's individual strength (Hypothesis 2)
  - Enters also as *interaction term* in some regressions (Hypothesis 3)
- Bank fixed effects μ_i, time fixed effects $\nu_{t|Euro}$ and $\rho_{t|USD}$

Hypothesis 1: Too Systemic to Fail ✓

VARIABLES	(1) CDS	(2) CDS	(3) CDS	(4) CDS
Support Rating	-0.298***	-0.265***		
	(0.0853)	(0.0632)		
Viability Rating	-0.496***	-0.448***		
	(0.0631)	(0.0501)		
Support Rating · Viability Rating		0.159***		
		(0.0271)		
Support Rating (t-1)			-0.278***	-0.251***
			(0.0865)	(0.0644)
Viability Rating (t-1)			-0.482***	-0.442***
			(0.0643)	(0.0509)
Support Rating (t-1) · Viability Rating (t-1)				0.150***
				(0.0281)
Constant	0.839***	0.910***	0.782***	0.845***
	(0.149)	(0.138)	(0.154)	(0.144)
Observations	20,276	20,276	19,403	19,403
R-Squared	0.554	0.583	0.542	0.566
Number of Banks	307	307	304	304
Time FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES

Hypothesis 2: Market Discipline ✓

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Results - Baseline Specification

- CDS spreads are lower for banks with higher *Support Rating* (Hypothesis 1 ✓)
- CDS spreads are higher for banks with higher risk, indicated by a lower *Viability Rating* (Hypothesis 2 ✓)
- Disciplinary effect of markets depends on the probability of receiving external support: (Hypothesis 3 ✓)
  - Market discipline is highest for banks with weak governmental guarantees
  - Governmental guarantee is valued highest for banks with a low viability

Hypothesis 4: Wake-Up Call ✓

VARIABLES	(1) CDS	(2) CDS	(3) CDS	(4) CDS
	Jan 2005 - Jul 2007			
Support Rating	-0.0567		-0.00418	
	(0.0650)		(0.0480)	
Viability Rating	-0.199***		-0.190***	
	(0.0471)		(0.0400)	
Support Rating - Viability Rating			0.0258	
			(0.0234)	
	Aug 2007 - Aug 2008			
Support Rating	-0.207**	-0.150***	-0.217***	-0.213***
	(0.0798)	(0.0515)	(0.0734)	(0.0574)
Viability Rating	-0.238***	-0.0390	-0.254***	-0.0640**
	(0.0562)	(0.0332)	(0.0421)	(0.0277)
Support Rating - Viability Rating			0.0829***	0.0571**
			(0.0313)	(0.0261)
	Sep 2008 - Sep 2009			
Support Rating	-0.565***	-0.358***	-0.458***	-0.240***
	(0.120)	(0.0889)	(0.0907)	(0.0711)
Viability Rating	-0.597***	-0.359***	-0.655***	-0.401***
	(0.0768)	(0.0731)	(0.0701)	(0.0587)
Support Rating - Viability Rating			0.296***	0.213***
			(0.0503)	(0.0529)
	Oct 2009 - Aug 2012			
Support Rating	-0.319***	0.246**	-0.150***	0.307***
	(0.0905)	(0.111)	(0.0563)	(0.0942)
Viability Rating	-0.644***	-0.0471	-0.612***	0.0433
	(0.0775)	(0.0776)	(0.0605)	(0.0690)
Support Rating - Viability Rating			0.216***	-0.0799
			(0.0226)	(0.0505)
	Sep 2012 - Jun 2014			
Support Rating	-0.183**	0.136***	-0.00984	0.140***
	(0.0807)	(0.0363)	(0.0498)	(0.0390)
Viability Rating	-0.609***	0.0352	-0.515***	0.0971
	(0.0802)	(0.0601)	(0.0521)	(0.0590)
Support Rating - Viability Rating			0.211***	-0.00502
			(0.0275)	(0.0242)
Constant	1.059***	1.059***	1.036***	1.036***
	(0.113)	(0.113)	(0.102)	(0.102)
Observations	20,276	20,276	20,276	20,276
R-Squared	0.598	0.598	0.641	0.641
Number of Banks	307	307	307	307
Time FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES

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Number of Banks	307	307	307	307
Time FE	YES	YES	YES	YES
Bank FE	YES	YES	YES	YES

Results - Wake-Up Call

- Market Discipline
  - Bank's individual strength was priced in the pre-crisis period
  - Effect increases dramatically after the Lehman default
  - Effect remains economically strong even in the post-crisis period
- TSTF:
  - No evidence for a TSTF effect in the pre-crisis period
  - Strong increase in the effect in both periods of the banking crisis
    - Increasing uncertainty about the true solvency of banks
  - Effect weakens in the time of the European debt crisis and in the post-crisis period
    - Diminishing uncertainty about the solvency of banks and growing uncertainty about the solvency of sovereigns

Extensions and Robustness

- GSIFIs vs. non GSIFIs
- Support Rating Floor
- Alternative interpretation of a missing Support Rating
- Balanced sample

1. Introduction

2. CDS, Support Rating and Viability Rating

3. Hypothesis and Empirical Model

4. Results - Baseline Specification

5. Conclusion

Conclusion

- Banks benefit from a cost advantage due to *implicit guarantees*
- Banks with a *weak financial strength* are punished by the market
- Effect of *market discipline* depends on the *probability of a bailout*:
  - Market discipline is strong if the bailout probability is low
  - Implicit bailout guarantee is worth most for banks with weak financial strength

Conclusion

- Banks benefit from a cost advantage due to *implicit guarantees*
- Banks with a *weak financial strength* are punished by the market
- Effect of *market discipline* depends on the *probability of a bailout*:
  - Market discipline is strong if the bailout probability is low
  - Implicit bailout guarantee is worth most for banks with weak financial strength

- Relevance of TSTF and market discipline *changes over time*
  - Value of the support probability increases during the banking crisis, but decreases during and in the aftermath of the European debt crisis
  - Banks viability has gained more importance during the crisis

Thank you very much for your attention!