Bank Capital: Lessons from the Financial Crisis

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Disclaimer

- **The views expressed herein are those of the authors and should not be attributed to the IMF, the World Bank, their Executive Board, or their management**

Background

- **One of the centerpieces of bank prudential regulation is bank capital regulation**
  - Banks are required to finance themselves with a minimum amount of capital rather than debt
  - If there is a loss, capital can be used to cover it without the bank becoming insolvent
  - With a bigger capital at stake, shareholders (or management, who represent them) behave more prudently

Background

- Banking systems were well capitalized based on regulatory standards before (and during) the crisis
- Yet, the crisis revealed that banks had taken on huge risks
- Why?

Background

- Maybe the “shock” was just too big (100 year flood…)
- Maybe capital does not make banks less risky

Background

- Maybe capital position was not so strong after all…
  - What regulators counted as capital was not really available to absorb losses (numerator)
  - Measured risk exposure did not reflect true risk (denominator)

Background

- **Post-crisis financial sector reform (Basel III): more/better bank capital regulation**
  - Focus on “higher quality capital” through stricter capital definitions and additional ratios
  - Risk-adjusted assets still at the denominator (though leverage ratio added)
  - Extra capital buffer that can be used in hard times

What do we do?

- During the crisis, all banks did poorly in terms of their stock market value, but some did better than others
- Were better performing banks also better capitalized?
- Was the main regulatory capital ratio the most “informative” measure of capital?
- The answers to these questions have implications for regulatory reforms

Summary of findings

- **In crisis times, some evidence that banks with more capital did better:**
  - Especially among larger banks and less well capitalized banks
  - The simple capital/total assets ratio (leverage ratio) more relevant than the Basel ratio, especially for large banks (crudest measure of risk exposure more informative than measure used by regulators)
  - Some evidence that "higher quality" capital was rewarded by stock market investors

Sample characteristics

- **Full sample: 381 listed banks in 12 countries (from Bankscope)**
- **Large bank sample: 91 listed banks in 8 countries (assets > $50 billion)**
- **Period examined:**
  - Crisis: Q3.2007-Q1.2009
  - Pre-crisis: Q1.2006-Q2.2007

Quarterly stock returns in percent: Q1..2006-Q1.2009

Methodology

- Regress quarterly stock returns on various measures of capital, allowing for different coefficients in the crisis period:
  - Regulatory ratio (Regulatory capital/risk-adjusted assets and off-balance sheet risk) (RWR)
  - Leverage ratio (Regulatory capital/assets) (LR)
  - Tier 1 and Tier 2 RWR
  - Tier 1 and Tier 2 LR
  - Common equity and other capital (RWR and LR)

Methodology

Controlling for country/time dummies (all macro factors and country characteristics) as well as:

- Liquidity
- Deposits/assets
- Net loans/assets
- Loan loss provisions
- Size
- Beta
- Market-to-book ratio
- Price-earnings ratio

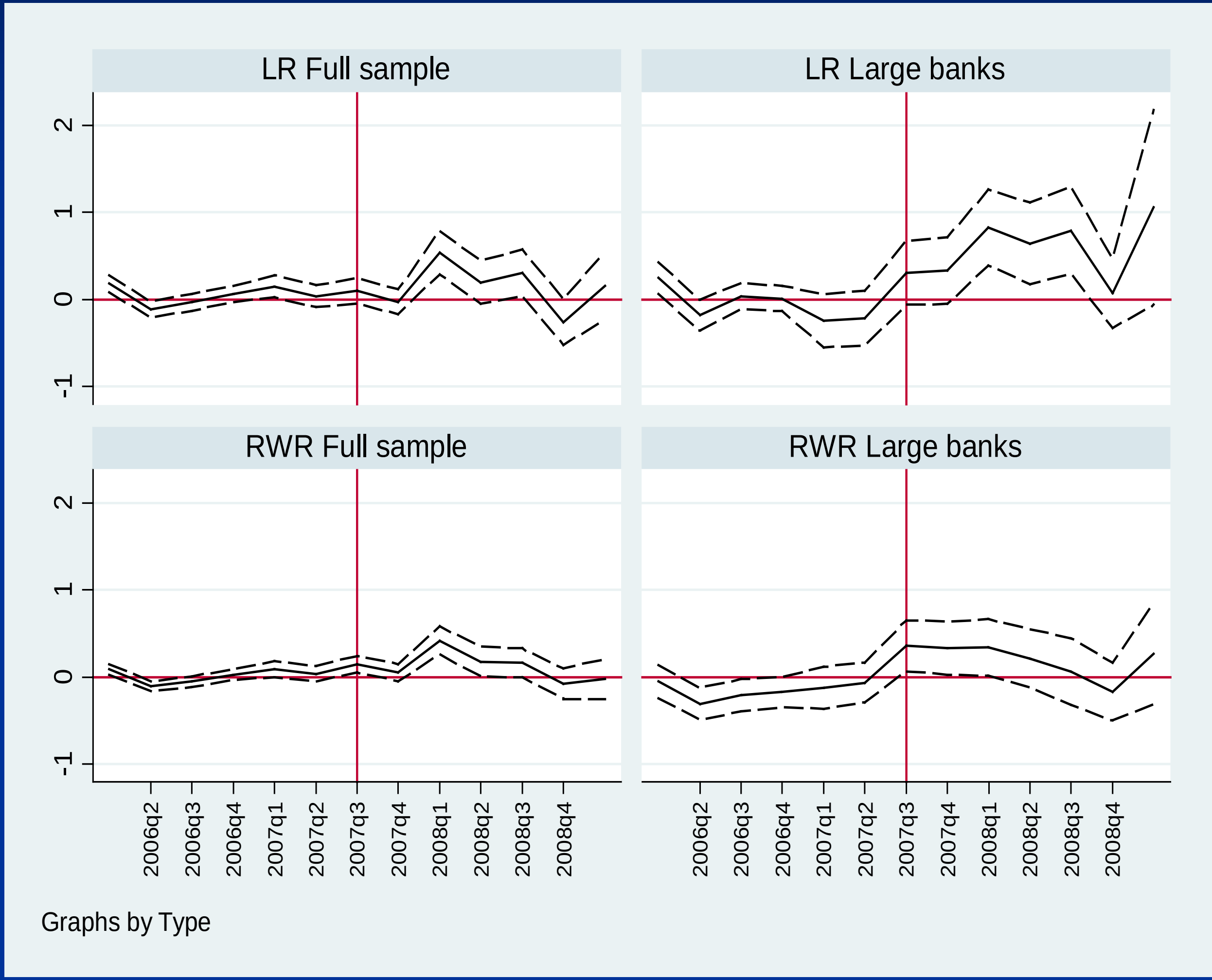
Definition of capital (from Bankscope)

- **Total capital= Tier I + Tier II**
- **Tier I capital:**
  - Shareholders' funds
  - Perpetual, non-cumulative preference shares
- **Tier II capital:**
  - Hybrid capital
  - Subordinated debt
  - Loan loss reserves
  - Valuation reserves

Sample characteristics: capital

Full sample						
			25th percentile		Median	Std. Dev.
RWRt			10.7		11.9	2.8
RWRt1			8.1		9.7	2.8
LRt			5.9		7.8	2.5
LRt1			4.7		6.3	2.4
Common equity/RWA			6.3		9.1	5.5
Common equity/TA			3.8		6.2	4.5
Large bank sample						
			25th percentile		Median	Std. Dev.
RWRt			10.6		11.7	2.4
RWRt1			7.2		8.2	1.9
LRt			5.4		6.5	2.2
LRt1			3.7		4.6	1.7
Common equity/RWA			3.4		7.2	3.9
Common equity/TA			1.9		4.1	3.3

Separate regressions for each quarter: coefficients lagged capital before and during the financial crisis, with 10 % s.e. bands



Results

	(1)	(2)	(3)	(4)
	Whole sample		Large banks	
	RWR	LR	RWR	LR
Tier1*PreCrisis	0.024	0.110*	-0.092	0.061
	[0.046]	[0.061]	[0.129]	[0.149]
Tier2*PreCrisis	0.074	0.006	-0.106	-0.252
	[0.055]	[0.072]	[0.145]	[0.178]
Tier1*Crisis	0.117	0.154	0.264	0.603***
	[0.080]	[0.108]	[0.186]	[0.210]
	(0.120)	(0.623)	(0.041)	(0.003)
Tier2*Crisis	0.051	0.058	0.131	0.415
	[0.098]	[0.188]	[0.257]	[0.350]
	(0.809)	(0.810)	(0.369)	(0.115)

Results

	(5)	(6)	(7)	(8)
	Whole sample		Large banks	
	RWR	**LR**	**RWR**	**LR**
Common equity*PreCrisis	0.015	0.048	-0.005	-0.003
	[0.018]	[0.034]	[0.089]	[0.143]
Other capital*PreCrisis	-0.097***	-0.079	-0.053	-0.214*
	[0.034]	[0.059]	[0.083]	[0.112]
Common equity*Crisis	0.114**	0.165**	0.283**	0.617**
	[0.044]	[0.067]	[0.126]	[0.278]
	(0.047)	(0.014)	(0.012)	(0.035)
Other capital*Crisis	-0.015	0.002	0.324**	0.561*
	[0.076]	[0.102]	[0.144]	[0.293]
	(0.407)	(0.251)	(0.008)	(0.015)

Results

- Basel ratios not significant
- In crisis, Tier 1 leverage ratio significant and positive for large banks
- Common equity significant in crisis also for full sample and in its RW form
- Even with common equity, the effect is larger with LR and for large banks

Results: Banks with different initial capital

	(1)	(2)	(3)	(4)
	Well Capitalized in 2006		Weakly Capitalized in 2006	
	RWR	LR	RWR	LR
Tier1*PreCrisis	-0.006	0.111	0.294*	0.18
	[0.079]	[0.125]	[0.162]	[0.126]
Tier2*PreCrisis	0.12	-0.044	0.177	0.061
	[0.105]	[0.123]	[0.137]	[0.134]
Tier2*Crisis	-0.023	-0.455*	0.390*	0.579*
	[0.187]	[0.268]	[0.204]	[0.316]
	(0.432)	(0.129)	(0.210)	(0.160)
Tier1*Crisis	0.018	-0.048	0.496***	0.498**
	[0.108]	[0.163]	[0.182]	[0.198]
	(0.792)	(0.126)	(0.092)	(0.054)

Conclusions

- There is evidence that more capital helped bank stock returns during the financial crisis
- Evidence that risk-adjustment of assets was not believable, especially for large banks
- Evidence that higher quality capital (common equity, Tier 1) mattered the most

Possible policy implications

- Less emphasis on lower quality capital (Tier 2, non-common equity)
  - *Basel III clearly goes in this direction*
- Put more emphasis on "non risk-adjusted" measures of capital (i.e., leverage ratio) especially for large banks
  - *The introduction of a minimum leverage ratio in addition to the RWR would go in this direction*

Thank you