



# 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

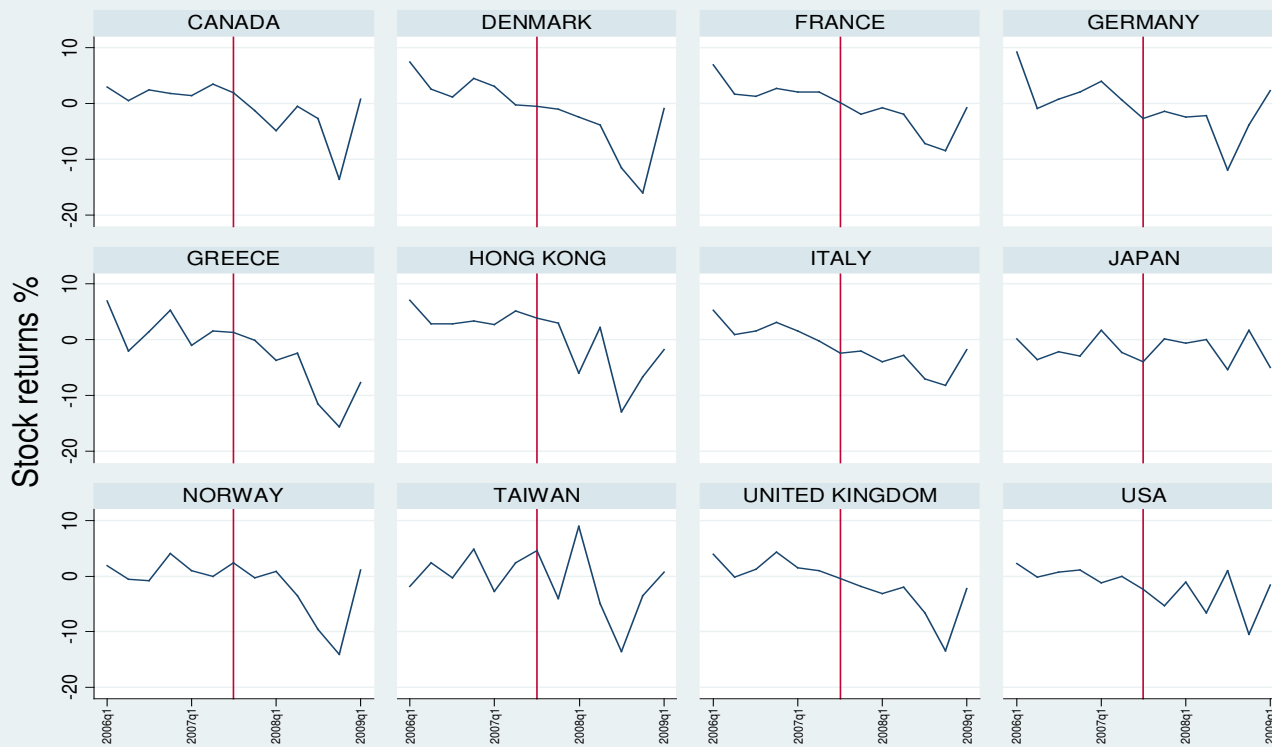


# Summary of findings

- 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



Graphs by Country Name

## 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

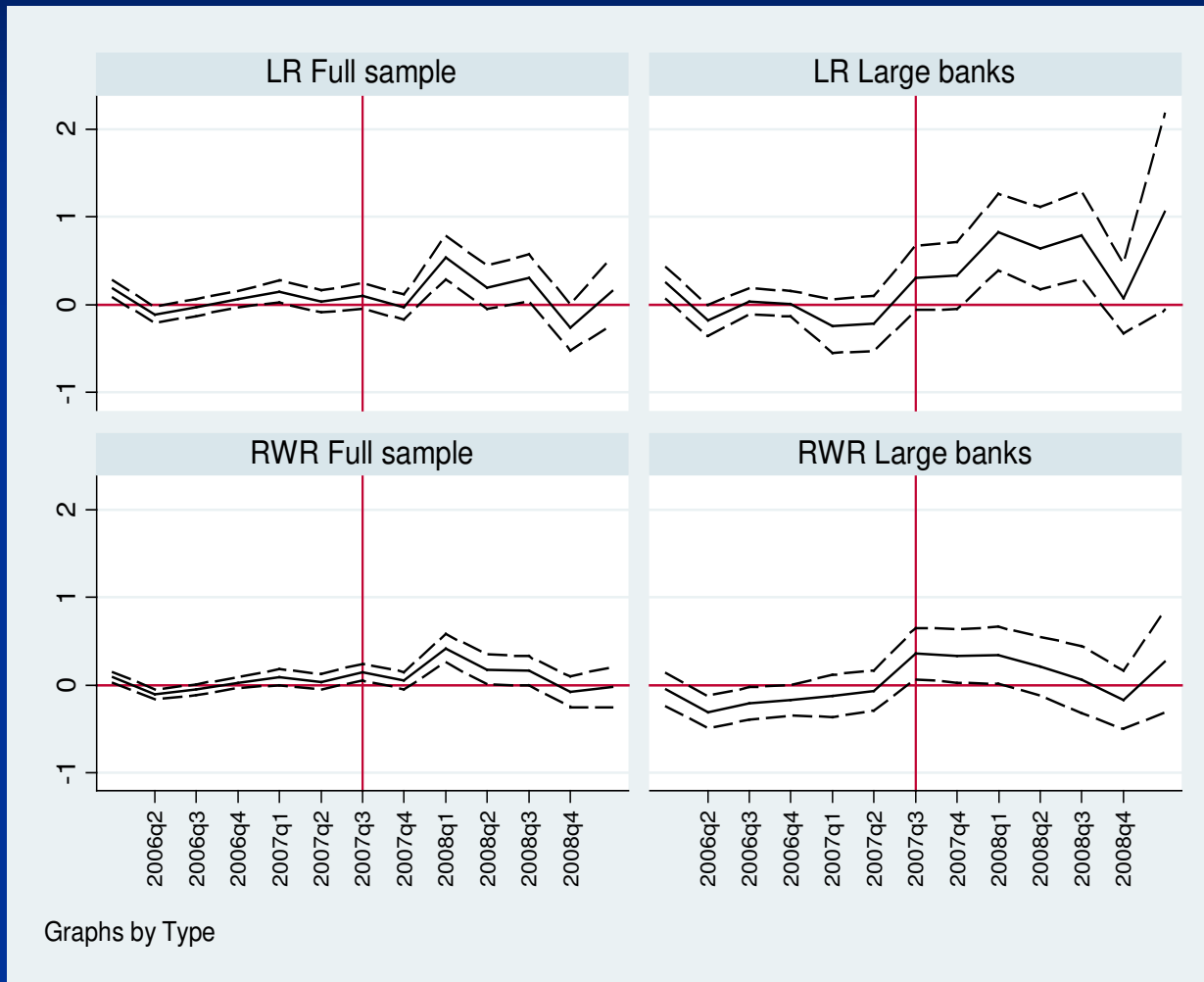
# Definition of capital (from Bankscope)

- **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

<b>Full sample</b>					
		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
<b>Large bank sample</b>					
		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 [0.046]	0.110* [0.061]	-0.092 [0.129]	0.061 [0.149]
Tier2*PreCrisis	0.074 [0.055]	0.006 [0.072]	-0.106 [0.145]	-0.252 [0.178]
Tier1*Crisis	0.117 [0.080] (0.120)	0.154 [0.108] (0.623)	0.264 [0.186] (0.041)	0.603*** [0.210] (0.003)
Tier2*Crisis	0.051 [0.098] (0.809)	0.058 [0.188] (0.810)	0.131 [0.257] (0.369)	0.415 [0.350] (0.115)

# Results

	(5)	(6)	(7)	(8)
	Whole sample		Large banks	
	RWR	LR	RWR	LR
Common equity*PreCrisis	0.015 [0.018]	0.048 [0.034]	-0.005 [0.089]	-0.003 [0.143]
Other capital*PreCrisis	-0.097*** [0.034]	-0.079 [0.059]	-0.053 [0.083]	-0.214* [0.112]
Common equity*Crisis	0.114** [0.044] (0.047)	0.165** [0.067] (0.014)	0.283** [0.126] (0.012)	0.617** [0.278] (0.035)
Other capital*Crisis	-0.015 [0.076] (0.407)	0.002 [0.102] (0.251)	0.324** [0.144] (0.008)	0.561* [0.293] (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 [0.079]	0.111 [0.125]	0.294* [0.162]	0.18 [0.126]
Tier2*PreCrisis	0.12 [0.105]	-0.044 [0.123]	0.177 [0.137]	0.061 [0.134]
Tier2*Crisis	-0.023 [0.187] (0.432)	-0.455* [0.268] (0.129)	0.390* [0.204] (0.210)	0.579* [0.316] (0.160)
Tier1*Crisis	0.018 [0.108] (0.792)	-0.048 [0.163] (0.126)	0.496*** [0.182] (0.092)	0.498** [0.198] (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**

