Can Taxes Tame the Banks?

Capital structure responses to the post-crisis bank levies

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Introduction

- Financial crisis: Banks were vulnerable because they relied excessively on financing with (short-term) debt
- Post-crisis policy agenda: Measures to prevent financial crises in the future
- Keen (2011): " *..action has been far ahead of analysis...*"
  - few empirical studies of how taxes affect bank capital structure
  - little analysis of the interaction between taxation and financial regulation
- Important research agenda: What is the effect of the new policy instruments?

This paper

- We study the recently introduced taxes on bank borrowing $\longrightarrow$ **bank levies**
- How do they affect bank **capital structure** and **risk taking**?
- Theory $\longrightarrow$ we should expect the levies to induce banks to move toward:
  - more equity financing
  - more risky assets
- Empirics $\longrightarrow$ we find robust positive effects on both equity and risk taking

Bank levies

Rationale

- Bank failures are associated with negative externalities $\longrightarrow$ government bailouts, financial contagion, bankruptcy costs
- Socially optimal bank behavior can be achieved with a Pigouvian tax (IMF, 2010)
- Bank levies fall on bank liabilities associated with systemic risk
  - equity exempt
  - insured deposits exempt
  - smaller banks exempt / subject to reduced rate
  - long-term funding sometimes subject to reduced rate
- Theoretical prediction $\longrightarrow$ levies induce banks to increase equity funding

Bank levies

Interaction with regulation

- Bank taxation generally interacts with financial regulation (Keen, 2011)
- We study a particular interaction $\longrightarrow$ the effect of bank levies on the risikiness of bank assets
- Intuition:
  - regulatory capital requirements $\longrightarrow$ capital / risk-weighted assets must exceed threshold
  - if bank levies induce banks to raise capital $\longrightarrow$ scope for increasing riskiness of assets
- Theoretical prediction $\longrightarrow$ levies induce banks (that are risk-constrained by financial regulation) to increase risk-taking

Bank levies

Implementation

- In 2010 EU countries discuss special resolution regimes $\longrightarrow$ no EU-level levy but recommendation to adopt country-level levies
- 13 EU countries introduced bank levies in the period 2009-2012
  - 10 of those were taxes on "risky liabilities": Austria (2011), Belgium (2012), Cyprus (2011), Germany (2011), Netherlands (2012), Portugal (2011), Latvia (2011), Slovakia (2012), Sweden (2009), UK (2011)
  - 3 were other types of levies: France (2011), Hungary (2010), Slovenia (2011)
- Also countries outside the EU consider implementing bank levies including the U.S.

Data

- Bank information $\longrightarrow$ *Bankscope*
  - balance sheets, income statements, regulatory capital
  - all roughly 5,000 banks in the EU
- Levy information $\longrightarrow$ hand-collected from various sources
  - levy rates
  - levy bases
  - implementation dates
- Sample period: 2008-2011

Summary statistics

	mean	s.d.
Liabilities		
- deposits from customers	0,53	0,30
- deposits from banks	0,17	0,20
- derivatives	0,01	0,04
- long term funding	0,10	0,17
- equity	0,13	0,17
Assets		
- loans to customers	0,53	0,26
- loans to banks	0,16	0,19
- derivatives	0,01	0,04
- securities	0,21	0,19

Empirical strategy

- We exploit three sources of variation:
  - some EU countries adopted levies, some did not
  - countries adopting levies apply different rates and bases
  - within countries adopting levies banks face different marginal rates (due to progressivity)

- We test whether
  - banks in countries introducing bank levies systematically increased their equity ratio and risk relative to banks in other countries
  - banks hit by larger bank levies systematically increased their equity ratio and risk relative to banks hit by smaller (or no) bank levies

  holding other things constant

Bank levies raise equity-asset ratios

	(1)	(3)	(4)	(6)	(7)
Estimator	OLS	OLS	OLS	OLS	IV
Dependent var.	Equity/Assets	Equity/Assets	Equity/Assets	Equity/Assets	Equity/Assets
levy	0.0151***	0.0120***			
marginal levy rate			0.2225***	0.2307***	0.2560***
inflation		0.0013*		0.0018***	0.0015***
gdp growth		0.0008***		0.0009***	0.0010***
corporate tax rate		-0.0574		-0.2207	0.0247
log assets		-0.1176***		-0.1176***	-0.1547***
log assets squared		0.0018		0.0018	0.0044***
profitability		0.0037***		0.0038***	0.0053***
Observations	18,137	18,101	18,137	18,101	17,524
R-squared	0.0070	0.2927	0.0034	0.2910	
bank FE	YES	YES	YES	YES	YES
time FE	YES	YES	YES	YES	YES

Robustness and further results

- Results are robust to inclusion of:
  - *region* $\times$ *time* dummies $\longrightarrow$ control for region specific shocks
  - *bank size* $\times$ *time* dummies $\longrightarrow$ control for bank size specific shocks
  - *equity / assets* $\times$ *time* dummies $\longrightarrow$ control for equity ratio specific shocks

- Results are robust to controls for regulatory changes:
  - larger risk-weights on trading assets (Capital Requirement Directive III, 2010)
  - temporary capital buffers for large banks (EU Banking Package, 2011)

- Increase in *equity / assets* comes from an increase in equity and not a decrease in assets

Bank levies raise the riskiness of assets

	(3)	(4)	(5)	(6)
Estimator	OLS	OLS	OLS	OLS
Dependent var.	RWA/Assets	RWA/Assets	RWA/Assets	RWA/Assets
marginal levy rate	0.3015**	0.3305**		
marginal levy rate × low reg. capital			0.5534***	0.5548***
marginal levy rate × high reg. capital			0.0087	0.1352
inflation		0.0005		0.0000
gdp growth		-0.0019*		-0.0025**
corporate tax rate		-0.1263		-0.2657
log assets		0.0281		-0.0041
log assets squared		-0.0051*		-0.0034
profitability		-0.1926		-0.0666
Observations	5,059	5,059	4,466	4,466
R-squared	0.0768	0.1003	0.0897	0.1158
bank FE	YES	YES	YES	YES
time FE	YES	YES	YES	YES
time FE × reg. capital dummies	NO	NO	YES	YES

Conclusion

- We study the effects of European bank levies on bank capital structure and risk taking using
- Empirical results: bank levies on average
  - increased equity-asset ratios by 1-1.5 %-points
  - increased the riskiness of bank asset