



BANK FOR INTERNATIONAL SETTLEMENTS

# Bank Liability Structure

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Discussant:

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# The paper in a nutshell

- Tractable model of bank liability structure
  - Extends Merton (1974) and Leland (1994) to banks
  - Allows for a quantitative analysis of optimal leverage
- Optimal leverage includes deposits and subordinated debt
  - Unregulated banks rely more on subordinated debt
  - Banks optimally default on their subordinated debt, precisely when the depositors choose to run
- Main results
  - With FDIC insurance, banks take on more deposits and less sub debt
  - When tax rates are reduced banks increase tangible equity



# Three main comments

- I. Reality check on the theoretical model
- II. The role of bank capital
- III. Impact of changes in the tax rate



# I. Reality check on the theoretical model



# Does the model match the real world? (1)

- Bank runs as a disciplinary device
  - Calomiris and Kahn (1991)
  - Diamond and Rajan (2001)

*Could the presence of such a mechanism affect the conclusions?*

- What about general equilibrium effects?
  - Deposit insurance affects the total supply of bank debt but not its composition. At the same time, dep. insurance influences demand of deposits and subordinated debt by households and non-bank investors.

*In reality, everything is determined endogenously. Does this simplification affect the results? How?*



## Does the model match the real world? (2)

- In the model, banks optimally default on their subordinated debt, precisely when the depositors choose to run
  - Default is not necessarily a variable of choice for the bank. In particular, when the bank liability structure includes instruments with optionality features related to the bank capitalization level (eg COCOs)
  - “Bank runs” can be triggered by “informed investors” on wholesale funding not by depositors (ie Northern Rock)

*Does this alter the mechanisms in place?*



## II. The role of bank capital



# Bank capital is essential for the functioning of the bank lending channel

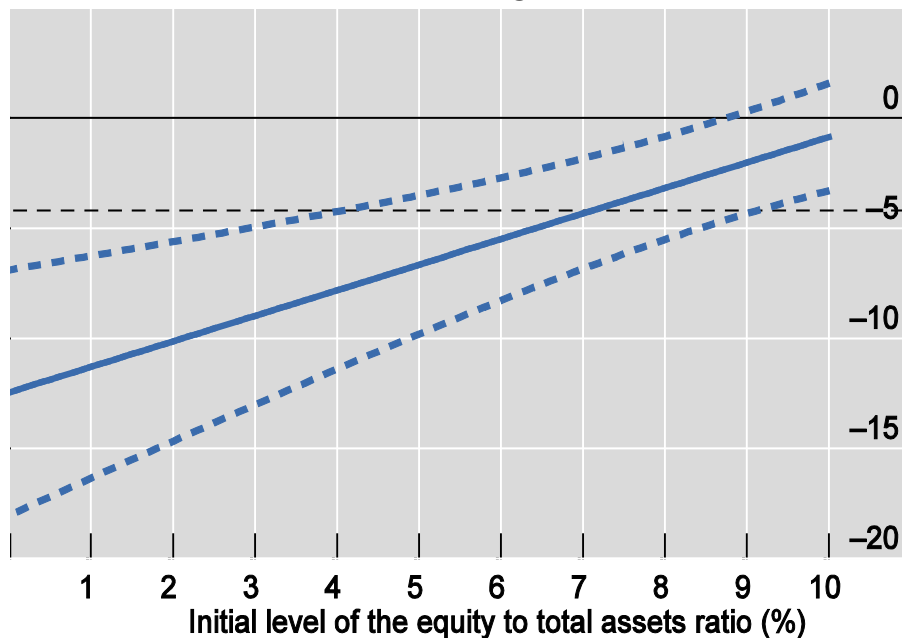
- In the model bank capital is costly
- But what we observe in reality is not so simple:
  - Well-capitalised banks supply more loans
  - Well-capitalised banks are perceived as “less risky” by depositors and investors and have easier/cheaper access to forms of funding such as bonds or uninsured deposits
  - A 1 percentage point increase in the equity-to-total-assets ratio is associated with a 4 basis point average reduction in the cost of non-equity financing. The effect is non-linear. (Gambacorta and Shin, 2016)



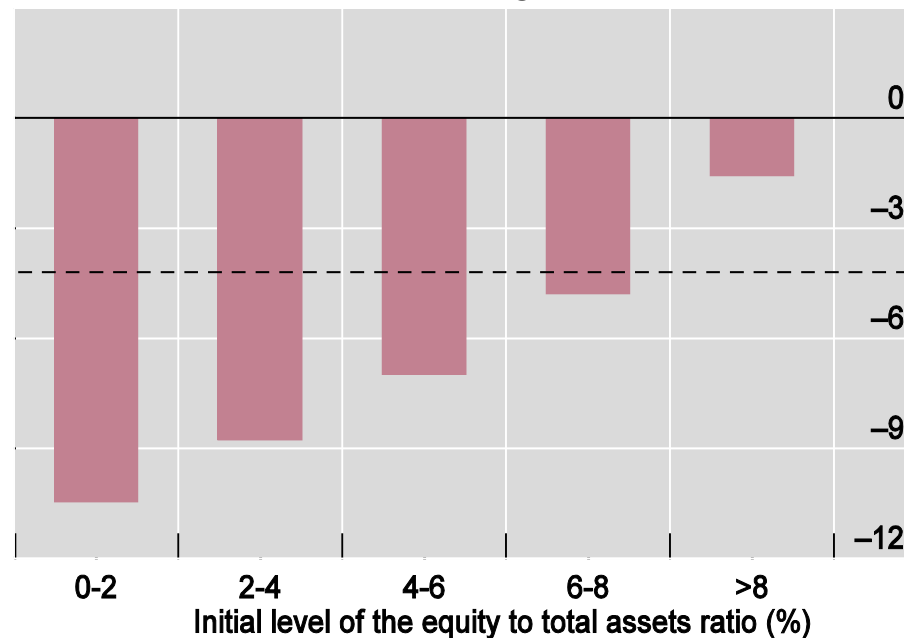


# Non-linear effect of higher bank capital on the cost of funding

Reduction in the costs of funding



Reduction in the costs of funding



Source: Gambacorta and Shin (2016).

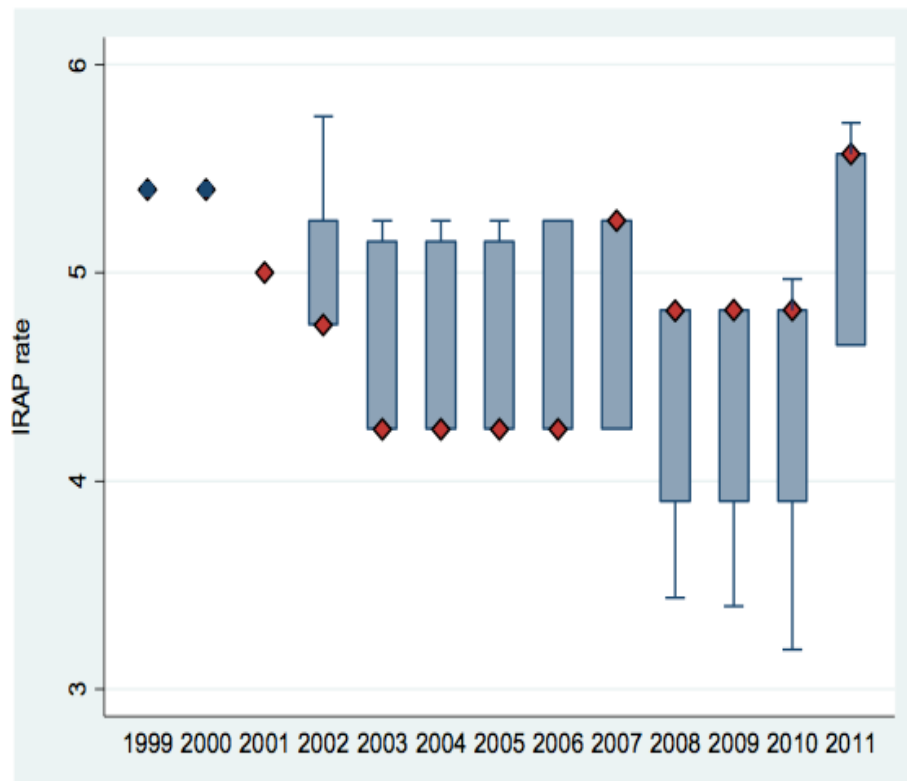


### III. Impact of changes in the tax rate on the bank liability structure



# Test of the model: from theory to the data

Figure 1: Variation in IRAP tax rates



Note: Median is indicated using diamond marks. The box represents 25th percentile to 75th percentile and the end mark represents the maximum and the minimum.

- Gambacorta et al (2016): the case of Italian mutual banks
- Corporate income tax + IRAP tax rate (regional component to fund healthcare deficits)
- No cross-sectional variations until 2002
- Median Tax rates experienced notable changes also in opposite directions

Year	IRAP tax rate (base)
1998-2000	5.40%
2001	5.00%
2002	4.75%
2003	4.25%
2008	3.90%
2011	4.65%

# Empirical Specification

$$y_{jit} = \gamma \Delta(\text{Tax rate})_{jt-1} + \text{controls} + \varepsilon_{ijt}$$



- Dependent variable  $y_{jit}$  is the change in the specific bank funding component: equity, deposits, bonds
- Controls include bank-specific characteristics, bank fixed effects and time fixed effects
- Focus of the analysis is on coefficient  $\gamma$  which tells us how bank liability components changes in response to a tax rate variation



## Results of the test

Variables	Dep. variable: $\Delta(\text{Equity/Total assets})$	Dep. variable: $\Delta(\text{Bonds/Total assets})$	Dep. variable: $\Delta(\text{Deposits/Total asset})$
$\Delta(\text{Tax rate})_{t-1}$	-0.1520*** (0.0582)	0.3906** (0.1835)	0.0878 (0.0561)
Bank-specific characteristics	Yes	Yes	Yes
Regional macro controls	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Number of obs.	4,940	4,940	4,940
Adjusted R-squared	0.1724	0.1505	0.1677

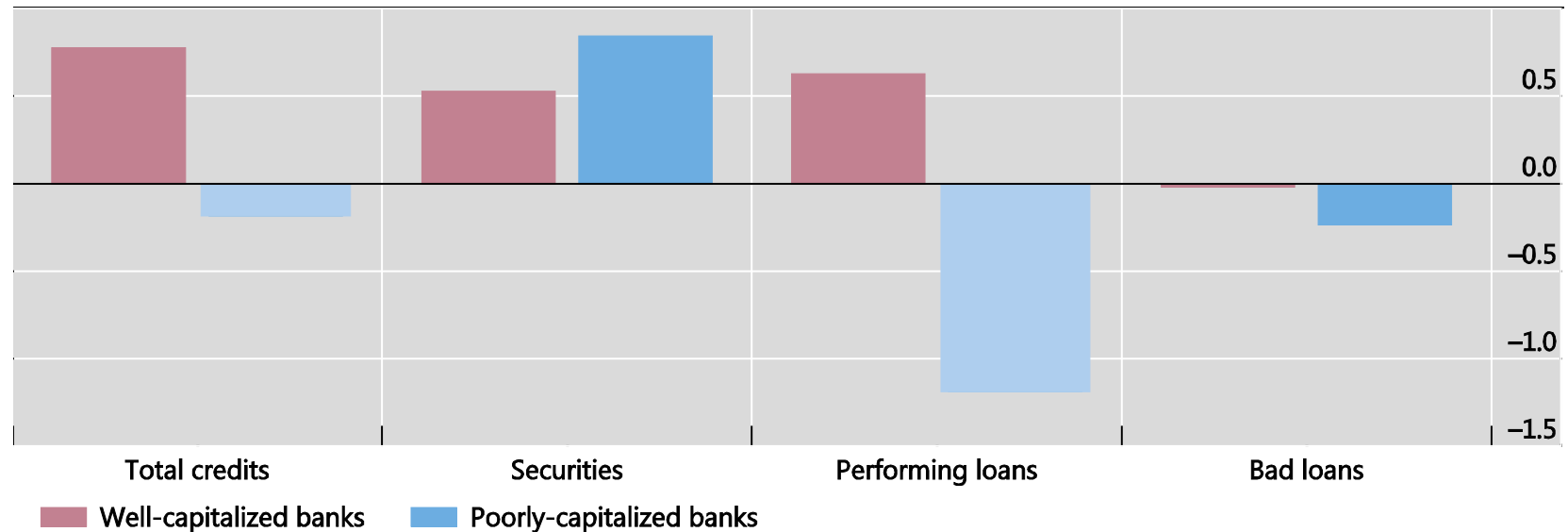
- A reduction of one percentage point in the tax rate leads to:
  - an increase of 0.15 percentage point in the ratio of tangible equity to TA
  - a drop in bonds (uninsured) that is larger than that on deposits (insured)

# A reduction in tax rates lead to an increase in securities and loans and a reduction in bad loans

Effects of lowering tax rate on bank's assets<sup>1</sup>

One percentage point reduction in the IRAP rate

Graph 1



<sup>1</sup> All balance sheet items are represented as a percentage of total assets. Effects that are statistically not significant are indicated in lighter blue.

Source: Authors' calculations.



## Conclusions

- Model is simplified to be tractable, needs a reality check on some aspects
- Role of bank capital is very simple and need to be checked for plausible calibration
- Conclusions of the model on the effects of changes in the tax rate are verified by the empirical analysis on Italian mutual banks. The model matches the real world

Very interesting paper!

