

Regulatory Heterogeneity and Credit Allocation

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Research Question

What is the effect of different capital regulation regimes on the efficiency of credit allocation in the economy?

Big Picture Message

Banks' internal risk models improve credit allocation!

Institutional background

Co-existence of two approaches of calculating risk weights for banks:

1. internal risk models approach (**IRBA**)
2. standardized approach (**SA**)

IRBA:

- Banks calculate risk weight for each borrower on their own
- Level can be from close to 0% up to 200%
- Risk weight has to be updated over time

SA:

- Risk weight is at 100% regardless of banks' internal assessment
- No update over time

Motivation

Why have both approaches?

- IRBA should measure risk more accurately
- IRBA too expensive for smaller banks, however

Any problems?

- Literature has documented that banks use IRBA to underestimate risks (Behn, Haselmann, and Vig, 2022; Plosser and Santos, 2018)
- FED in summer 2023 announced to **abolish IRBA**

Theory

3-period model ($t = 0, 1, 2$) of a bank with costly capital. Bank gives 2-period loans to borrowers. Capital has to be held both in $t = 0$ and $t = 1$. Bank is forward looking and considers total capital cost of loan over whole loan duration when taking credit supply decision.

Main point: there is a mean-variance trade-off. SA has higher mean of risk weights, IRBA higher variance of risk weights. Depending on borrowers' risk characteristics, credit allocation different between the approaches.

Concrete Hypotheses:

- 1.a The higher the risk weight of a borrower, the lower credit supply.
- 1.b The higher the risk weight *variation* of a borrower, the lower credit supply.
- 2.a For low risk levels, IRBA credit supply is higher than SA.
- 2.b For high risk levels, SA credit supply is higher than IRBA.

Data

German credit registry from 2000 to 2020. Information on bank characteristics, borrower characteristics, loan volume, IRBA/SA, internal risk weight.

Empirical Results – Micro-level

$$L_{b,f,t} = \beta_1 \text{Risk_Weight_Level}_{b,f,t-1} + \beta_2 \text{Risk_Weight_Variation}_{b,f,t} + \gamma X_{b,t-1} + \delta_{f,t} + \delta_b + \epsilon_{b,f,t}$$

	Log(Loan Volume)			
	(1)	(2)	(3)	(4)
RiskWeight Level	-0.4425***	-0.4144***	-0.3761***	-0.3480***
RiskWeight SD	-0.9623***	-0.9698***	-0.7901***	-0.7883***
CollateralizationRatio	0.4318***	0.4300***	0.3175***	0.3165***
IRBA Loan		0.2820***		0.2981***
Bank FEs	Yes	Yes	Yes	Yes
Borrower FEs	No	No	Yes	Yes
Time FEs	No	No	Yes	Yes
Controls	No	Yes	No	Yes
Borrower × Time FEs	Yes	Yes	No	No
N	1,133,710	1,133,710	1,133,710	1,133,710
R ²	0.7343	0.7347	0.6221	0.6228

Empirical Approach – Macro-level

1) IRB share within a 3-digit industry:

$$IRBA_Share_{s,t} = \frac{L_{s,t}^{IRBA}}{L_{s,t}^{Total}}$$

2) Markup dispersion following De Loecker, Eeckhout, and Unger (2020):

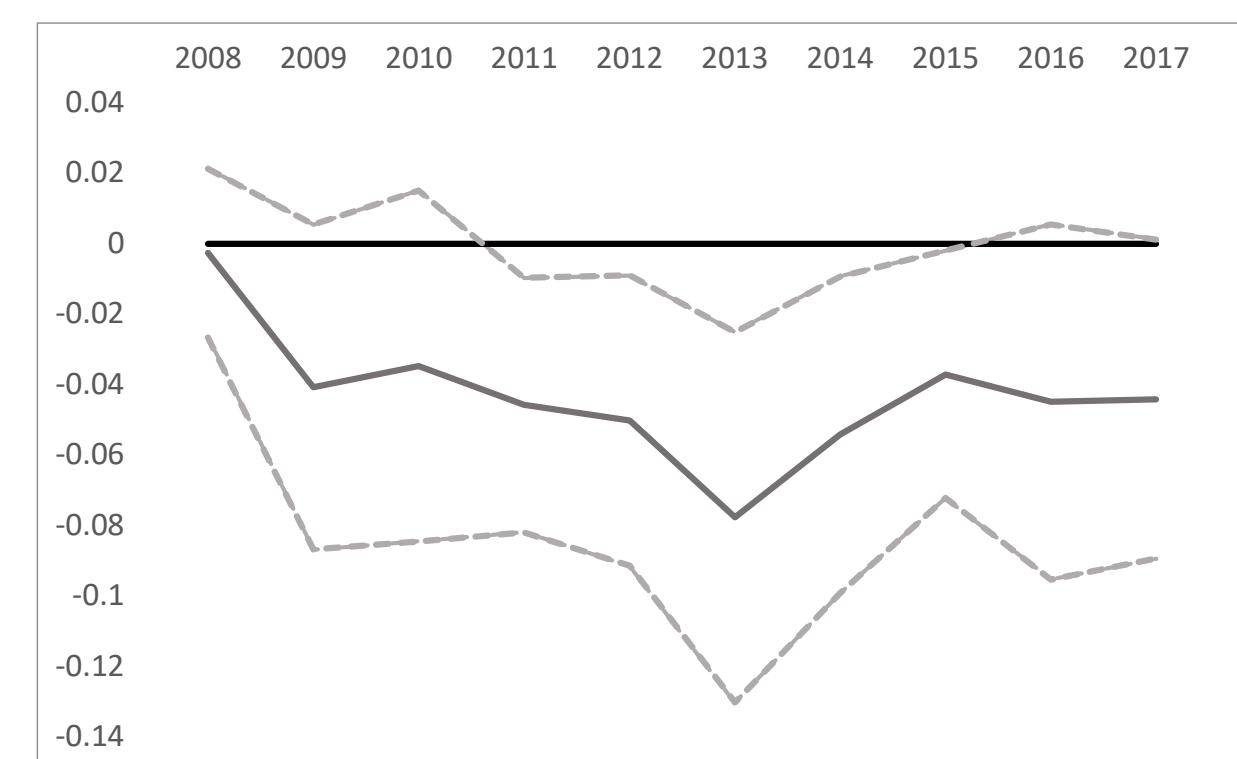
$$\hat{\mu}_{f,t} = \log \mu_{f,t} - \frac{1}{N_{s,t}} \sum_{f \in S} \log \mu_{f,t}$$

where $\mu_{f,t}$ is the ratio of costs of goods sold to gross sales, $N_{s,t}$ is the number of firms in sector s in year t and S is the set of these firms.
⇒ Lower dispersion = more efficient allocation

Empirical Results – Macro-level

$$Y_{i,2007+h} = \beta_h IRBA_Share_{s,2007} + X_{s,t} + \delta_t + \epsilon_{s,t}$$

where $Y_{s,2007+h}$ is the sector-level standard deviation of Markups, h years from 2007. $IRBA_Share_{s,2007}$ is the share of credit outstanding in 2007 in an industry which is coming from banks who *after* 2007 become IRBA banks.



Take-Aways and Conclusion

Take-Aways:

- Different approaches lead to different credit supply to *same borrower* (cf. Fraise, Lé, and Thesmar (2020))
- This heterogeneity aggregates to the sector-level
- Sectors with credit supply dominated by IRBA banks have more efficient credit allocation

Conclusion:

- IRBA contains moral hazard problem, BUT allows for more efficient credit allocation
- Financial stability vs. economic growth trade-off for regulators goes beyond *level* of capital and includes cross-borrower *allocation* of capital
- Morally hazardous behaviour of banks creates positive externality
- FED's action with respect to IRBA may be premature!

Literature

Behn, M., R. Haselmann, and V. Vig (2022): "The limits of model-based regulation," *The Journal of Finance*, 77, 1635–1684.

De Loecker, J., J. Eeckhout, and G. Unger (2020): "The rise of market power and the macroeconomic implications," *The Quarterly Journal of Economics*, 135, 561–644.

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