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# **Measuring and Forecasting Financial Stability**

**Workshop by Deutsche Bundesbank and Technische Universität Dresden**  
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**Comments on „Bank Ownership and Stability: Evidence from Germany“**

Comments on  
Bank Ownership and Stability: Evidence from  
Germany

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# Research Questions

- What is the relationship between **bank ownership** and **bank stability**?
- Does bank ownership moderate the relationship between
  - **Bank size** and **bank stability**?
  - **Loan concentration** and **bank stability**?

# Contributions

- Three distinct measures of **bank ownership**
  - Private, savings, and cooperative banks
  - Institutional and macroeconomic environment is kept unchanged
- Three interrelated measures of **bank stability**
  - Z-score, non-performing loans (NPL), probability of distress (PD)
  - Previous work mostly focused on one of these measures
- Relationship between **bank size** and **bank stability/loan concentration** and **bank stability** is moderated by **bank ownership**

# Methodology

## Random Effects Model

- Impact of **bank ownership** on **bank stability**

$$Score_{it} = \delta_p + \delta_s D^S + \delta_c D^C + \beta B_{it-1} + \gamma M_{it} + u_i + \varepsilon_{it} \quad (1)$$

- Moderating effect of **bank ownership** on the relationship between **bank size** and **bank stability/loan concentration** and **bank stability**

$$\begin{aligned} Score_{it} = & \delta_p + \delta_s D^S + \delta_c D^C + & (2) \\ & + \beta_p^1 Size_{it-1} + \beta_s^1 (D^S Size_{it-1}) + \beta_c^1 (D^C Size_{it-1}) + \\ & + \beta_p^2 Con_{it-1} + \beta_s^2 (D^S Con_{it-1}) + \beta_c^2 (D^C Con_{it-1}) + \\ & + \dots + u_i + \varepsilon_{it} \end{aligned}$$

# Results (I)

## Impact of Bank Ownership on Bank Stability

Bank stability	Z-score	NPL	PD
Savings > Private	Yes	Yes	Yes
Coop > Private	Yes	Yes	Yes
Coop > Savings	Yes	?	No

- Private banks are the riskiest
- Ranking of coop's and savings not robust across risk measures

## Results (II)

### Moderating Effect of Bank Ownership

Bank stability		Z-score	NPL	PD
Savings > Private		No	Yes	?
Coop > Private		No	Yes	Yes
Coop > Savings		-	-	-
Bank size improves stability	Savings	Yes	?	Yes
	Coop	Yes	No	?
	Private	No	Yes	Yes
Loan concentration improves stability	Savings	Yes	?	Yes
	Coop	No	Yes	?
	Private	Yes	?	?

- Support for too-big-to-fail notion for private banks (Z-score)
- Loan concentration improves stability of private and savings banks, the opposite conclusion holds for coop's (Z-score)

# Discussion

- Endogeneity
- Model specification
- Other remarks/suggestions

# Endogeneity

- A common problem for studies using generated stability measures

- First stage:  $\hat{P}D = f\left(\frac{CAP_{t-1}}{RWA_{t-1}}, \dots\right)$

- Second stage:  $\hat{P}D = \delta + \beta RWA_{t-1} + \dots$

- The endogeneity problems can be especially severe given that the fixed effects method is not feasible
- Possible solution
  - Length of lags needs to be chosen more carefully

# Model specification

- Add lagged value of stability on the RHS and use Arellano-Bond GMM estimator
  - Persistency in bank stability (Garcia-Marco & Robles-Fernandez, 2008)
- Test the validity of model specification
  - Panel test of autocorrelation in residuals (Wooldridge, 2002)
- Z-score is censored at zero, since it measures the number of standard deviations profitability should go down to trigger insolvency
  - RE model is not applicable, use Tobit model

## Other remarks/suggestions

- Exclude ownership interaction effects for variables other than size and loan concentration
  - More parsimonious model
  - Little theoretical justification for other interaction terms
- Include a measure of ownership concentration
  - Herfindahl index (Garcia-Marco & Robles-Fernandez, 2008)
  - Dummy for listed private banks (Iannotta et al., 2007)
- Include a dummy for merged banks, since merger affects bank ownership composition and size
- Rescale Z-score to its reverse, which would be consistent with the other two measures

# Conclusion

- Interesting and very timely topic
- The current results are pretty mixed
- Addressing the endogeneity issue and adding relevant control variables may produce more consistent results