Cyclicality of SME Lending and Government Involvement in Banks

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Cyclicality of SME Lending and Bank Ownership

This paper:
Does the cyclicality of lending depend on government involvement in banks?

Focus on:
- Lending to SMEs
- Small, local banks with vs. without government involvement
- Stable conditions (Germany)
- Long time horizon (1987-2007)

Mitigating tools, eg counter-cyclical capital buffers, dynamic loan loss provisioning rules, LTV caps etc.

Main finding
SME lending of banks with government involvement: 25% less sensitive to GDP growth than that of banks without government involvement

Contribution to the literature

- **Observations**
  - Different cyclicality of public vs. private debt (Becker and Ivashina 2014)
  - Government involvement in banks:
    - Lending focus, poor performance and low efficiency of large, central government-controlled banks (e.g., La Porta et al 2002, Sapienza 2004 …)
    - Role of government-controlled banks for economic development (Stiglitz 1993, Burgess and Pande 2005, Ostergaard et al. 2009)
    - Importance for SME finance (Behr et al. 2013, Hakenes et al. 2015)
    - Outcomes depend on the legal and political institutions of the country (e.g., Körner and Schnabel 2011, Bertay et al. 2014)

- **Our contribution**
  - We test whether the cyclicality of small local banks' SME lending differs
  - We show: The difference largely depends on banks' business objectives

Institutional background

- German economy
  - SMEs: 96% of all firms, largely dependent on bank financing
  - Universal banking system:
    - Banks with government involvement (e.g., savings banks)
    - Credit cooperatives
    - Privately owned commercial banks
- Savings banks:
  - Established and controlled by municipalities of the area in which they operate
  - Government involvement in form of a public mandate stated in their by-laws
    - Non-discriminatory provision of financial services to local customers
    - Local credit supply and promotion of savings
    - Deviate from strict profit maximization
    - But: No direct government ownership (as in many other studies)
- Credit cooperatives: Share many similarities with savings banks in terms of size, regional orientation and focus on lending to SMEs, but do not have government involvement → are profit-maximizers (more than savings banks)

Bank-level data

- Yearly bank-level data on balance sheets and income statements
- Sample: 461 German savings banks, 330 German cooperative banks
- Period: 1987–2007 (pre-crisis, several economic cycles)
- Key variable: Real yearly loan growth to SMEs, winsorized at 0.5% / 99.5%

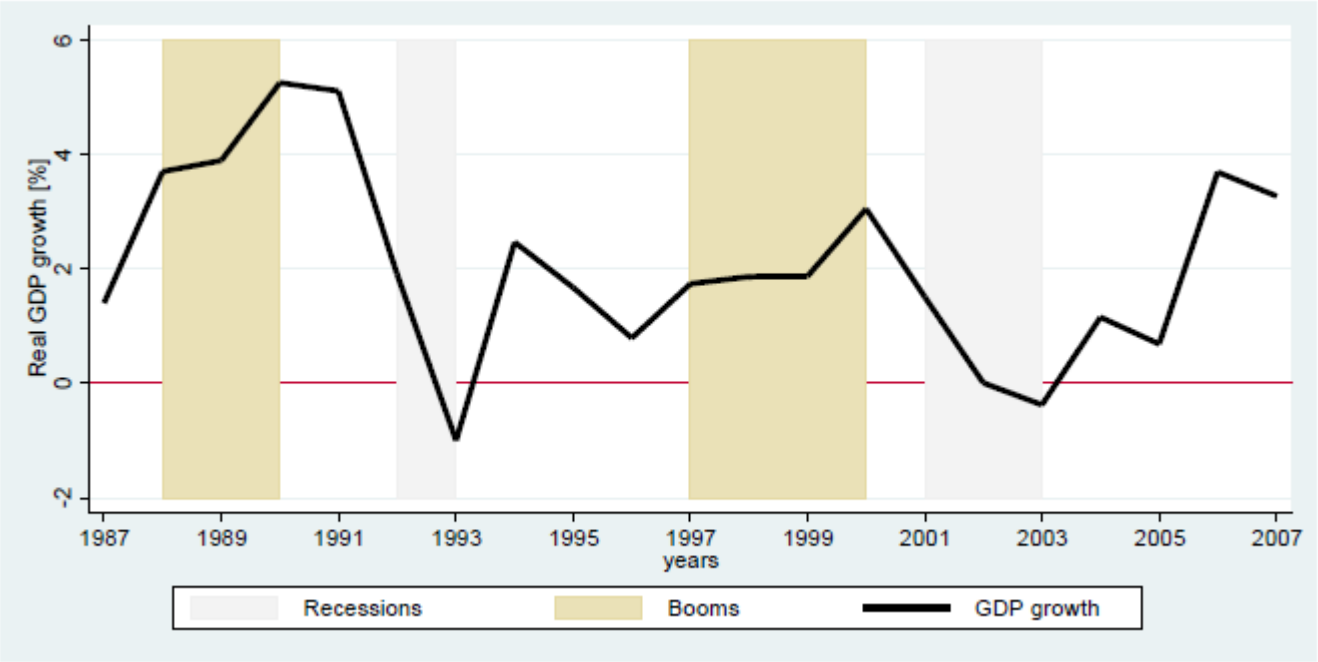
$$SME\_LG_{i,t} = \frac{total\ SME\ loans\ (t) - total\ SME\ laons\ (t-1)}{total\ SME\ loans\ (t-1)}$$

- Control variables:

		Mean(Sav.)	Mean(Coop.)
Total assets	()	1.85 bn €	0.99 bn €
Total customer loans	()	1.11 bn €	0.63 bn €
Relative interest income	()	6.89%	6.84%
Relative net interest result	()	0.74%	1.50%
Equity-to-total assets ratio	()	4.40%	5.12%
Liquid assets ratio	()	2.53%	2.68%
Long-term loans ratio	()	69.29%	59.34%
Interbank loans ratio	()	13.32%	17.24%
Deposit funding ratio	()	69.82%	74.64%

Macro-economic data

- Real GDP growth of Germany



- Several alternative indicators of the business cycle used in robustness checks: IFO business climate index, real regional GDP growth, real investment growth, loan demand as measured by European bank lending survey data

Empirical identification

- Our measure of cyclical bank behaviour
  The link between SME loan growth and measures of the business cycle (GDP growth…), controlling for main bank characteristics, bank-specific fixed effects, and time- and region-specific demand side shocks (using year*region fixed effects)

- This correlation is measured over several economic cycles (1987-2007)

- We compare savings banks (with government involvement) with credit cooperatives (without government involvement)
  - Similar lending model (local focus, long-term lending, retail financing)
  - Similar borrower structure – differences are likely supply side-driven

→ A cross-sectional identification based on long-run data

Empirical approach

- Regression model for bank in year in a dynamic setting:

$$SME\_LG_{i,t} = \alpha + \beta_1 \Delta GDP_t + \beta_2 (SAV_i * \Delta GDP_t) + \beta_3 SAV_i + \beta_4 SME\_LG_{i,t-1} + \beta_5 SME\_LG_{i,t-2} + \delta X_{t-1} + \gamma_{c,t} + \varepsilon_{i,t}.$$

- is expected to be positive given that bank lending tends to be cyclical
- If is significantly negative, savings banks are less cyclical than their peers

- Control variables which enter the regression with a one-year time lag
- Year-region fixed effects (or year-specific fixed effects)

- Baseline estimator: One-step System GMM (Blundell and Bond 1998) with Windmeijer's (2005) correction, purging bank-specific fixed effects
- Alternative models: Least squares fixed effects, weighted least squares with propensity-score matching

Regression results

Dependent variable: Loan growth to SMEs

Model	(1)	(2)	(3)	(4)	(5)	(6)
Sample	1987-2007	1987-2007	1987-2007	1987-2007	1987-2007	PSM
Estimator	Sys. GMM	Sys. GMM	Sys. GMM	Sys. GMM	Least Squares Fixed Effects	Weighted Least Squares
ΔGDP_t	0.487***	0.434***	0.320*	1.027***	0.689***	0.681***
	(0.056)	(0.056)	(0.172)	(0.119)	(0.110)	(0.108)
$SAV_i * \Delta GDP_t$	-0.316***	-0.317***	-0.351***	-0.256***	-0.410***	-0.246***
	(0.063)	(0.063)	(0.061)	(0.071)	(0.063)	(0.047)
$LG\_SME_{i,t-1}$	0.574***	0.576***	0.428***	0.371***	0.250***	0.299***
	(0.021)	(0.022)	(0.035)	(0.044)	(0.035)	(0.010)
$LG\_SME_{i,t-2}$	0.132***	0.148***	0.150***	0.168***	0.035***	0.018*
	(0.019)	(0.020)	(0.026)	(0.031)	(0.011)	(0.010)
Covariates	yes	yes	yes	yes	yes	yes
Year fixed effects	no	no	yes	no	no	no
Year-region fixed effects	no	no	no	yes	yes	yes
Number of observations	9743	9740	9740	8376	8376	9975
Number of banks	791	791	791	786	786	527
Test for AR(1): Pr > z	0.000	0.000	0.000	0.000		–
Test for AR(2): Pr > z	0.974	0.556	0.422	0.107		–
Hansen test: Pr > χ^2	0.123	0.117	0.495	0.572		–
Number of instruments	728	728	749	782		–

Mechanisms for different cyclicality:
Bank size, loan maturity, funding structure and liquidity

Model	(1)	(2)	(3)	(4)
Discriminant variable	$AVGSIZE_i$	$AVGLTLR_i$	$AVGRELDEP_i$	$AVGLIQTA_i$
ΔGDP_t	1.109***	0.983***	1.138***	0.856***
	(0.136)	(0.150)	(0.140)	(0.153)
$Tercile2 * \Delta GDP_t$	-0.078	0.189***	-0.022	0.177
	(0.142)	(0.150)	(0.141)	(0.142)
$Tercile3 * \Delta GDP_t$	-0.256*	-0.235*	-0.405***	0.345**
	(0.134)	(0.142)	(0.153)	(0.164)
$SAV_i * \Delta GDP_t$	-0.396***	-0.235*	-0.473***	-0.043
	(0.117)	(0.131)	(0.122)	(0.113)
$SAV_i * Tercile2 * \Delta GDP_t$	0.152	-0.226	0.178	-0.201
	(0.167)	(0.172)	(0.165)	(0.167)
$SAV_i * Tercile3 * \Delta GDP_t$	0.312*	0.242	0.455***	-0.449**
	(0.160)	(0.171)	(0.172)	(0.188)
Bank controls and fixed effects	yes	yes	yes	yes
Number of observations	8376	8511	8376	8376
Number of banks	786	787	786	786

- Smaller savings banks, savings banks with less long-term loans, savings banks with a relatively low fraction of deposit financing, and with a lot of liquid assets are less cyclical
- The average effect of lower cyclicality at savings banks survives this test

Mechanisms for different cyclicality (cont'd): Liquidity and deposit funding further explored

Model	(1)	(2)
Dependent variable	ΔLiq_t	ΔDep_t
ΔGDP_t	4.457***	0.083
	(0.906)	(0.105)
$SAV_i * \Delta GDP_t$	-1.483***	-0.195***
	(0.533)	(0.066)
$RII_{i,\,t-1}$	-5.697***	0.236
	(1.445)	(0.224)
$RNIR_{i,\,t-1}$	-0.154	0.402***
	(0.747)	(0.096)
$ETA_{i,\,t-1}$	-0.685	0.003
	(0.858)	(0.191)
$LIQTA_{i,\,t-1}$		-0.090
		(0.075)
$LTLR_{i,\,t-1}$	0.097	-0.015*
	(0.065)	(0.008)
$IBLR_{i,\,t-1}$	0.304***	-0.036***
	(0.088)	(0.012)
$DEPR_{i,\,t-1}$	0.025	
	(0.110)	
Bank-level fixed effects	yes	yes
Year*region fixed effects	yes	yes
Number of observations	9403	9403
Number of banks	788	788
R-squared (within)	0.156	0.217

Further empirical tests

- Alternative indicators of the business cycle
  - IFO business climate index as economic early warning indicator ✓
  - Real regional GDP growth ✓
  - Real investment growth ✓
  - Loan demand as measured by European bank lending survey data ✓
- Splits for high vs. low GDP growth: Symmetric effect in up-/ downturns ✓
- Bank competition (Herfindahl-Hirschman index or concentration ratio): ✓
  Savings banks behave even less cyclically when bank competition is low
- Direct political influence on lending behaviour: Even lower cyclicality of savings banks in election years does not reduce the baseline effect ✓
- Risk taking: High-risk savings banks (in terms of write-offs and loan loss provisions) are more sensitive to GDP growth than low-risk savings banks, i.e., no risk taking effect due to lower cyclicality ✓

Conclusion

- SME lending of savings banks that follow a public mandate is 25 percent less cyclical than that of other banks from the same location

- Mechanisms
  - Liquidity and deposit funding as mechanisms to achieve lower cyclicality
  - Findings suggest time-varying differences in bank lending standards (approve relatively more loan applications in recessions, but reject relatively more applications in booms) → avenue for future research

- Policy implications
  - Influence mix of strictly profit-maximizing banks and those who pursue sustainability goals to determine the cyclicality of bank lending
  - Promote SME lending to foster local economic growth: local savings banks, government-sponsored/guaranteed lending or other arrangements
  - Lower need for counter-cyclical regulations if banks are already less cyclical because of their business objectives (here: public mandate)