Buying insurance at low economic cost - The effects of bank capital buffer increases since the pandemic

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Motivation

▶ Since the pandemic, euro area macroprudential authorities **increased capital buffer requirements beyond previously observed levels**

▶ The aim being to increase macroprudential space in the form of more releasable buffers (mainly CCyB and sSyRB)
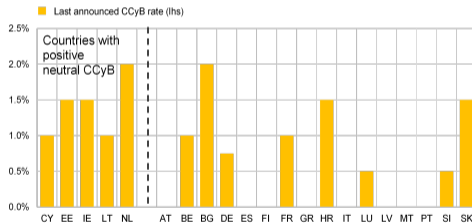
(a) Implemented and announced CCyB rates in % of RWA. From Behn et al. 2023 "A positive neutral rate for the countercyclical capital buffer – state of play in the banking union", ECB Macroprudential Bulletin April 2023. Sources: ECB; notifications by national authorities

Motivation

▶ Capital buffer increases serve to **strengthen banking sector's resilience**, but the literature has shown they **can restrain bank lending supply**

▶ Increase in capital buffer requirements happened in a period of **buoyant bank profitability** (lhs) and **strong capital levels** (rhs)
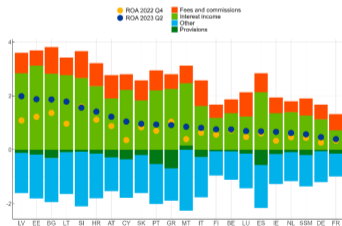
(a) Return on assets and components as % of total assets. Sources: ECB Supervisory Data and Authors' calculations

(b) Share of capital-constrained institutions (share of banking sector total RWAs in percent). Sources: ECB Supervisory Data and Authors' calculations; notifications by national authorities.

Introduction

- ▶ By building on the literature on state-dependent effects of changes in bank capital requirements, **we test whether the impact on credit supply is contingent on banking sector conditions** (capital headroom heterogeneity)

- ▶ We match granular supervisory and credit registry data for 2,146 banks in 19 euro area countries and more than 15 million loans to assess the impact of buffer increases on bank lending after the pandemic

- ▶ Our identification strategy relies on both multiple bank (Khwaja & Mian, 2008) as well as single bank relationships (Degryse et al., 2019)

- ▶ We also look at lending in all its nuances: intensive margin, extensive margins, overall bank-firm credit, term loans

Introduction

We find that, for the average bank, the buffer requirement increases did not have a statistically significant impact on corporate lending (intensive and extensive margins)

- ▶ While we document **relatively slower loan growth** for banks with **less capital headroom** (distance to the CBR smaller than 4%). . .
- ▶ . . . such banks **did not decrease lending in absolute terms** in response to higher requirements
- ▶ Banks with lower capital headroom **contract lending to firms with single bank relationships and to smaller firms**, although substitution effects mitigate the impact at the firm-level

Data sources and sample selection

- ▶ AnaCredit (+RIAD): All debt instruments other than: deposits, reverse repo, NAs, more than 1 creditor, more than 1 debtor
- ▶ ECB Supervisory data
- ▶ National Authorities' notifications of capital-based measures
- ▶ Time period considered **2021 Q1 – 2023 Q2**
- ▶ **2,146 banks** post estimation operating in 19 euro area countries

Empirical strategy: Variable of interest

$$\Delta CBR_{b,t} = CBR_{b,t}^{ann} - CBR_{b,t}$$

▶ CBR^{ann} is the Combined Buffer Requirement implied by implemented **and announced** capital buffers (CCyB, (s)SyRB, OSIIB/GSIIB) for bank b in quarter t, i.e. we take the announced rate at future dates and we multiply it by the applicable exposure at time t.

▶ CBR is the actual requirement for bank b at time t.
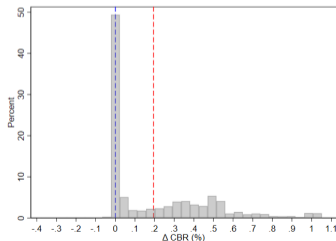
(a) Distribution of Delta CBR
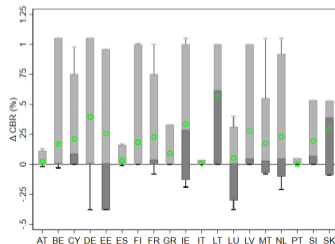
(b) Cross-country distribution of Delta CBR

Empirical strategy: econometric specifications

$$y_{bft} = \alpha_b + \alpha_{ft} + \beta \Delta CBR_{b,t} + \gamma X_{b,t-1} + \varepsilon_{bft}$$

where:

- y can be either $\Delta log(loans_{bft})$ or a dummy for a new relationship
- α_{ft} are firm-quarter FE (or ILS-quarter) and α_b are bank FE
- $X_{b,t-1}$ is a vector of lagged bank-level control variables (e.g. TSCR, CET1 ratio, log TA, RW density, ROA, NPL ratio, % deposits, % loans, % cash)
- Standard errors are clustered at the bank level

$$y = \alpha_b + \alpha_{ft} + \beta_1 \Delta CBR_{b,t} + \beta_2 [\Delta CBR_{b,t} \times D(D2CBR_{b,2021Q1} < \tau)] + \gamma X_{b,t-1} + \varepsilon_{bft}$$

- D2CBR dummy dummy equal to **one when bank b' s CET1 ratio** in excess of the CBR **is below threshold τ of the distribution in 2021 Q1**, computed at different quantiles

Results: Intensive margin (multiple bank-relationships)

▶ Baseline average effect and for the median bank is statistically indistinguishable from zero

▶ Less capitalised banks restrict lending in relative terms when buffers increase

	(1)	(2)	(3)	(4)	(5)
			Endogenous variable: Δ ln (loans)		
ΔCBR	0.7738	1.4231	1.3991	1.2464	1.3327
	(1.021)	(0.891)	(1.083)	(1.065)	(1.081)
ΔCBR × D(D2CBR<Median)		-0.9808			
		(0.747)			
ΔCBR × D(D2CBR<Tercile)			-1.6271**		
			(0.726)		
ΔCBR × D(D2CBR<Quartile)				-1.3956*	
				(0.795)	
ΔCBR × D(D2CBR<Quintile)					-1.7355**
					(0.899)
Observations	15,148,271	14,907,333	14,907,333	14,907,333	14,907,333
Bank FE	Yes	Yes	Yes	Yes	Yes
Borrower*Time FE	Yes	Yes	Yes	Yes	Yes
Cluster S.E.	Bank	Bank	Bank	Bank	Bank
Joint coeff		0.439	-0.229	-0.149	-0.403
p-value		0.72	0.82	0.89	0.71

- ▶ Limitation of KM approach is the exclusion of single bank-relationships which are absorbed by firm-time fixed effects
- ▶ In our sample, firms with a single bank relationship represent the largest fraction of all firms in most euro area countries (Chart)
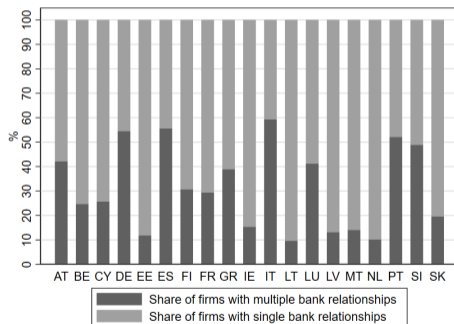
(a) Single vs multiple bank relationships across countries

Results: Intensive margin (multiple & single bank-relationships)

▶ We include single bank relationships in the estimation via ILS-quarter fixed effects

▶ Banks with a distance to CBR below the quintile restrict lending also in absolute terms when buffers increase

	Endogenous variable: Δ ln (loans)				
	(1)	(2)	(3)	(4)	(5)
ΔCBR	-0.0145	0.4214	0.4264	0.3853	0.4613
	(0.503)	(0.448)	(0.512)	(0.515)	(0.527)
ΔCBR × D(D2CBR<Median)		-0.7951			
		(0.686)			
ΔCBR × D(D2CBR<Tercile)			-1.5445**		
			(0.711)		
ΔCBR × D(D2CBR<Quartile)				-1.6179**	
				(0.819)	
ΔCBR × D(D2CBR<Quintile)					-1.9640**
					(0.901)
Observations	32,165,694	31,870,382	31,870,382	31,870,382	31,870,382
Bank FE	Yes	Yes	Yes	Yes	Yes
ILS*Time FE	Yes	Yes	Yes	Yes	Yes
Cluster S.E.	Bank	Bank	Bank	Bank	Bank
Joint coeff		-0.37	-1.11	-1.23	-1.50
p-value		0.621	0.133	0.134	0.077

Results: Intensive margin (only single bank-relationships)

▶ Less capitalised banks contract lending to single bank relationship firms following a buffer increase, both in relative and in absolute terms

▶ Firms borrowing from multiple banks can shield their borrowing from bank-specific shocks relative to firms borrowing from a single bank (Detragiache et al., 2000) or may suffer from the so called "lock-in" effect (Sharpe, 1990)

	Endogenous variable: Δ ln (loans)				
	(1)	(2)	(3)	(4)	(5)
ΔCBR	-0.4233	-0.1047	-0.0825	-0.0604	0.0074
	(0.394)	(0.349)	(0.383)	(0.386)	(0.395)
ΔCBR × D(D2CBR<Median)		-0.6687			
		(0.671)			
ΔCBR × D(D2CBR<Tercile)			-1.5039**		
			(0.705)		
ΔCBR × D(D2CBR<Quartile)				-1.7876**	
				(0.796)	
ΔCBR × D(D2CBR<Quintile)					-2.0998**
					(0.852)
Observations	17,388,363	17,331,922	17,331,922	17,331,922	17,331,922
Bank FE	Yes	Yes	Yes	Yes	Yes
ILS*Time FE	Yes	Yes	Yes	Yes	Yes
Cluster S.E.	Bank	Bank	Bank	Bank	Bank
Joint coeff		-0.77	-1.58	-1.84	-2.09
p-value		0.247	0.023	0.015	0.008

- ▶ 80% of large and medium firms have multiple bank relationships, while the share decreases progressively for small and micro enterprises to around 65% and 30%, respectively
- ▶ Capital constrained banks experiencing a CBR increase should curtail lending mostly to small and micro firms, especially if these firms have only a single bank relationship
- ▶ Results confirm that less capitalised banks ($<$ Quintile) contract credit to SMEs, especially those with single bank-relationships
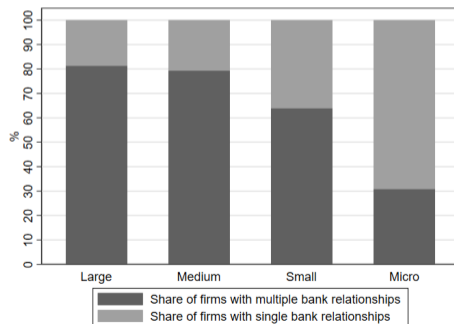
(a) Share of firms with single/multiple bank relationships per firm size

Results: Substitution effects

Firms borrowing from banks closer to the CBR may be able to offset any contraction in credit from these banks by borrowing more from banks further away from the regulatory threshold

HighExposure is a dummy taking the value 1 for firms that have more than 50% of their credit originating from banks below the first quintile of the distance to CBR distribution ($< 3.6\%$) and affected by a positive increase in buffer requirements

	Endogenous variable: Δ ln (borrowing)		
	(1)	(2)	(3)
High exposure	-0.0032	0.0097**	-0.0008
	(0.003)	(0.004)	(0.004)
Single Relationship		-0.0707***	-0.0805***
		(0.002)	(0.003)
High exposure × Single Relationship		-0.0092**	0.0021
		(0.004)	(0.004)
High exposure × SM			0.0118**
			(0.005)
Single Relationship × SM			0.0107***
			(0.003)
High exposure × Single Relationship × SM			-0.0125***
			(0.005)
Observations	22,698,199	22,698,199	22,698,199
ILS*Time FE	Yes	Yes	Yes
Cluster S.E.	Largest lender	Largest lender	Largest lender
Joint coeff		0.0004	
p-value		0.867	

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Additional analyses & robustness

► Extensive margins (probability to establish a new bank-firm relationship)
► Restricting the sample to term loans
► Continuous distance to CBR
► Different quantiles of the capital headroom distribution
► Controlling for relationship lending
► Controlling for the interest rate hike period

Conclusions

▶ We have examined the impact of capital buffer requirement increases since the pandemic on corporate lending in the euro area

▶ For the average bank, buffer requirement increases did not exert a statistically significant impact on corporate lending

▶ A relative slowdown in loan growth only emerges for banks close to the CBR, who also did not decrease lending in absolute terms

▶ Single relationship firms and smaller firms experienced somewhat stronger negative effects, although credit substitution by better capitalised banks seems to have mitigated the firm-level impact

▶ **Activating releasable capital buffers at an early stage of the financial or economic cycle appears to be a robust policy strategy, as it allows policy makers to 'buy insurance at low economic cost'.**