Caution: Do Not Cross! Distance to Regulatory Capital Buffers and Lending in Covid-19 Times

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This paper

- *Buffers* are capital requirements banks can countercyclically consume during crisis to avoid restricting credit
- We explore with bank-firm data whether euro area banks were willing to use their buffers to support corporate credit during the COVID-19
- Banks with lower capital above buffers lent less than others, suggesting unwillingness to use their buffers
- Their clients could not fully compensate with other banks, leading to headcount losses, but credit guarantees limited those effects
- These findings raise concerns that the capital buffers introduced by Basel III may not be as countercyclical as intended.

Motivation

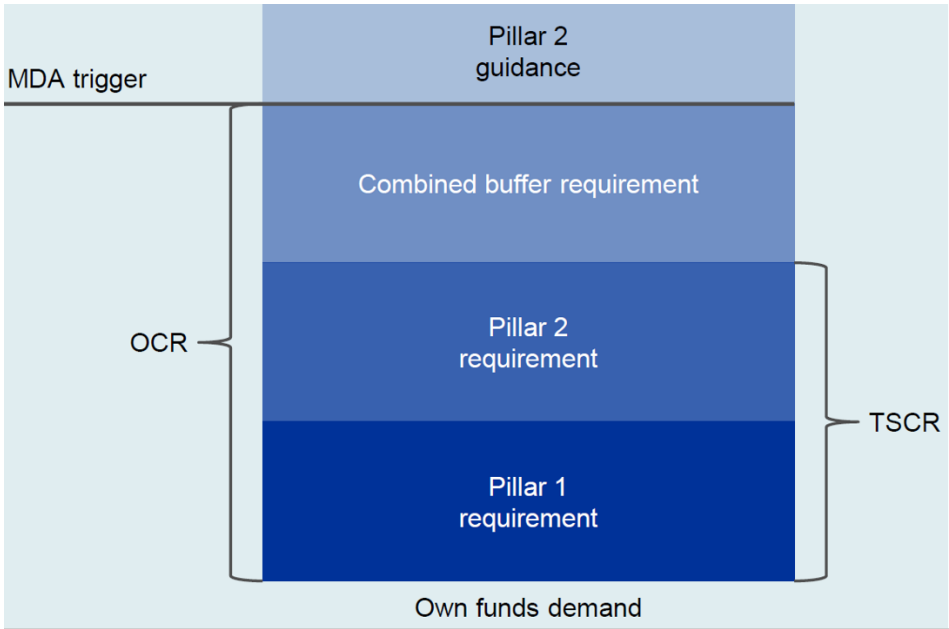
- The 2008-10 crisis proved bank capital should be countercyclical
- *Buffers* are a macroprudential tool to improve countercyclicality
- However, there are reasons for banks not to use their buffers
- The COVID-19 was the first systemic shock since the creation of buffers
- The fact that at the macro level banks met credit demand may hide micro level issues for banks that had low excess capital above buffers

Outline

1. The Concept of buffer usability
2. Methodology
3. Results
4. Conclusion

The Concept of Buffer Usability

- The GFC made clear that we need countercyclical bank capital, i.e.:
  - Increasing in good times and
  - Used during crisis to absorb losses instead of rationing credit
- As such, the Basel III package created *regulatory buffers*: capital requirement that:
  - Sit above *minimum requirements* (to be met at all times) Detailed stack
  - Banks can (and should) breach in crisis time, triggering restrictions on payout, the Maximum Distributable Amount (BCBS, 2011)



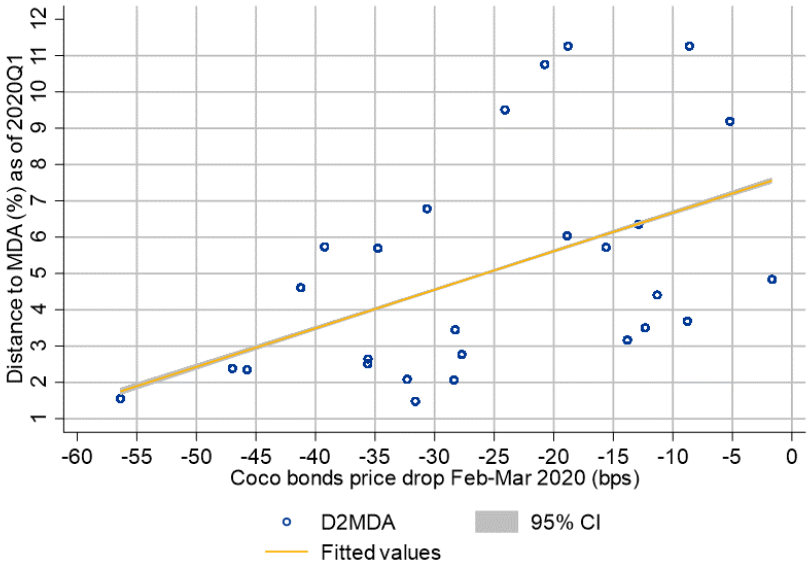
Possible impediments to buffer use

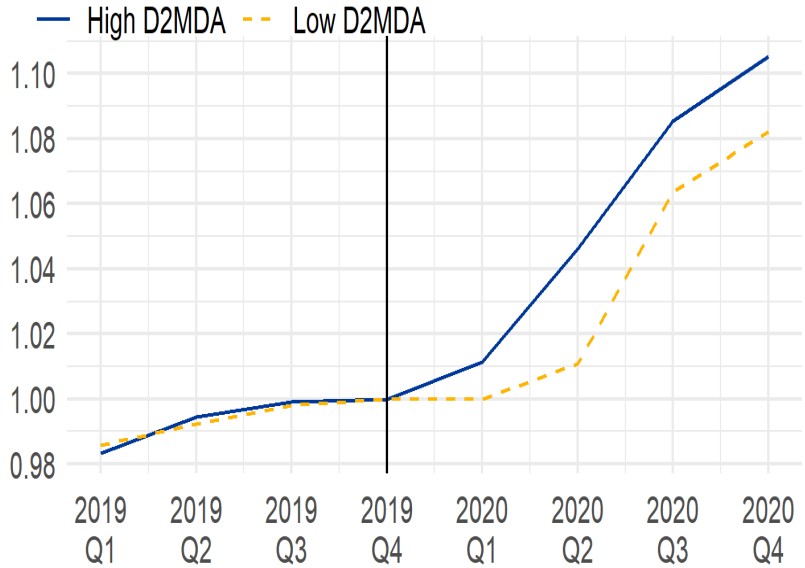
- However banks in proximity of the MDA trigger may face a number of impediments:
  - **Market stigma** $\rightarrow$ negative repercussions on bank funding cost, rating grades and distribution restrictions (dividends, bonuses and AT1 coupons).
  - **Uncertainty** $\rightarrow$ replenishment time once the crisis normalises.

- The COVID-19 triggered both a surge in corporate credit demand and large loss expectations $\rightarrow$ typical case for banks to use buffers

Initial evidence of impediments to buffer use

- Banks with less excess capital above buffers point faced market stigma pressure immediately after the spread of the pandemic
- Banks with low excess capital behaved like others before the COVID...
- ... but increase much less their credit supply during the COVID crisis





Research Questions and Contribution

Research Questions

- Did banks with less excess capital lend less during the pandemic?
- Were borrowing firms able to find credit from other banks?
- Did credit guarantee schemes support credit supply from banks with low excess capital?

Our contribution

- Among the first papers to empirically assess *buffer usability* in crisis time
- We explore the interaction between credit guarantee schemes and capital buffers

Econometric Identifications 1/2: Bank-firm level

$$\Delta Log(loans)_{i,k} = \alpha_k + \beta Low.D2Buffer_i + \tau X_i + \delta Z_{i,k} + \gamma_j + \epsilon_{i,k} \quad (1)$$

- Bank-firm credit collapsed at pre- (2019 Q3-Q4) and post-event (2020 Q3-Q4) averages (Bertrand et al., 2004)
- $Low.D2Buffer_i$ is a dummy taking the value 1 if bank i belongs to the lowest quartile of distance to to buffer pre-COVID, 0 otherwise
- α allows to control for firms' credit demand (Kwaja and Mian, 2008) and γ for banks' country policies
- Alternatively, we replace α with industry-location-size fixed-effects, retaining single bank relationships (Degryse et al., 2019)
- X and Z control for bank characteristics and other policies supporting credit during the COVID Full list

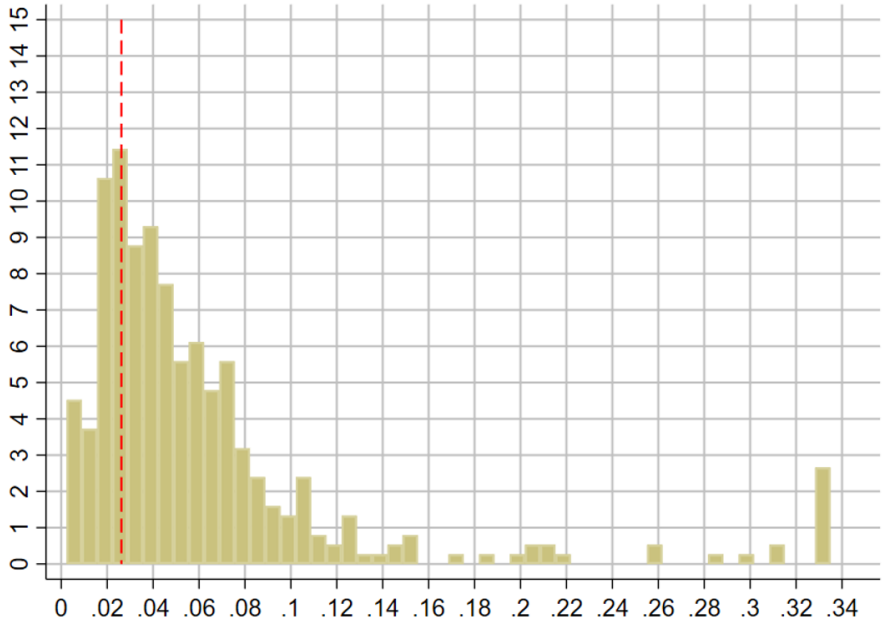
Econometric Identifications 2/2: Firm level

$$\Delta Log(borrowing)_k = \alpha_{ils} + \beta Exp.Firm_k + \lambda S.GUAR_k + \sigma Exp.Firm_k * S.GUAR_k + \tau X_i + \delta Z_i + \gamma_j + \epsilon_k \quad (2)$$

- A firm is *Exposed* when more than 25% of its pre-COVID credit cames from banks with low excess capital
- $S.GUAR_k$ is the share of post-COVID credit with public credit guarantee
- Bank and policy-control variables computed as the average of pre-COVID lending banks, weighted by their share of credit to firm k
- Pivotal for policy-makers identifying substitution effects

Data & excess capital

- Credit data: European corporate credit register (Anacredit), with all corporate loans above 25,000€
- Banking data: Supervisory banking data informing on banks' characteristics
- Banks are deemed with "Low distance to buffer" if their excess capital is below 2.6p.p. (first quartile).



Propensity score matching 1/2

- The level of excess capital can be endogenous to banks' preference
- Need to build comparable groups of banks with different level of excess capital

$\rightarrow$ Use of Propensity Score Matching to get comparable groups

- We match on all bank-level control variables

Propensity score matching 2/2

Unmatched sample

Variable	#	OCR	TA.log	RWA/TA	MKT	NIM	NPL	LIQUID	DIVERS
Large *D2Buffer*	282	0.118	22.96	0.49	0.059	0.015	0.031	0.121	0.385
Low *D2Buffer*	94	0.113	22.884	0.531	0.068	0.016	0.063	0.121	0.388
Welch test		1.92*	0.33	-2.35**	-0.7	-1.72*	-3.88***	-0.02	-0.1

Variable	OFF BS	LOAN	CIR	PROV.	TLTRO	DIV.	FORB.
Large *D2Buffer*	0.144	0.819	0.706	0.007	0.031	0.001	0.035
Low *D2Buffer*	0.168	0.811	0.778	0.005	0.043	0	0.036
Welch test	-1.85*	0.58	-1.56	2.52**	-1.83*	0.99	-0.12

Matched sample

Variable	#	OCR	TA.log	RWA/TA	MKT	NIM	NPL	LIQUID	DIVERS
Large *D2Buffer*	282	0.114	23.367	0.503	0.088	0.016	0.055	0.114	0.369
Low *D2Buffer*	94	0.113	23.173	0.511	0.075	0.016	0.058	0.126	0.376
Welch test		0.53	0.66	-0.36	0.72	0.08	-0.3	-0.65	-0.26

Variable	OFF BS	LOAN	CIR	PROV.	TLTRO	DIV.	FORB.
Large *D2Buffer*	0.179	0.836	0.71	0.005	0.049	0.001	0.032
Low *D2Buffer*	0.183	0.818	0.713	0.005	0.046	0	0.035
Welch test	-0.18	1.04	-0.06	-0.54	0.4	0.81	-0.45

- Post-matching the two groups have comparable characteristics

Loan-level results

- Banks with low excess capital lent substantially less during the pandemic

	Dependent variable: Δ Log (loans)			
	Unmatched Firm FE	Matched Firm FE	Unmatched ILS FE	Matched ILS FE
Low.D2Buffer	-0.0355***	-0.0926***	-0.0344*	-0.0892***
	(0.0116)	(0.0153)	(0.0192)	(0.0328)
Firm FE	Yes	Yes		
Bank country FE	Yes	Yes	Yes	Yes
ILS FE			Yes	Yes
Control variables	Yes	Yes	Yes	Yes
Observations	978,055	417,343	2,348,622	1,348,854
R^2	0.70033	0.71066	0.33407	0.31016

Loan-level results: the role of credit lines

- Banks with low excess capital and high undrawn credit lines reduced more their credit supply

	Dependent variable: Δ Log (loans)			
	Unmatched Firm FE	Matched Firm FE	Unmatched ILS FE	Matched ILS FE
Low.D2Buffer	0.0547	-0.0013	0.0702*	0.0521
	(0.0345)	(0.0317)	(0.0414)	(0.0510)
L.CR LINES/TA	0.3749**	0.5286***	0.4835**	0.8616***
	(0.0153)	(0.1162)	(0.1968)	(0.1502)
Low.D2Buffer × L.CR LINES/TA	-0.6294***	-0.5690***	-0.7298***	-0.8749***
Firm FE	Yes	Yes		
Bank country FE	Yes	Yes	Yes	Yes
ILS FE			Yes	Yes
Control variables	Yes	Yes	Yes	Yes
Observations	978,055	417,343	2,348,622	1,348,854
R^2	0.7006	0.4720	0.3168	0.3301

Loan-level results: the role of credit guarantees

- Credit guarantee scheme substantially alleviated credit supply constrain from banks with low excess capital

	Dependent variable: Δ Log (loans)			
	Unmatched Firm FE	Matched Firm FE	Unmatched ILS FE	Matched ILS FE
Low.D2Buffer	-0.0768***	-0.1020***	-0.0712**	-0.1137***
	(0.0155)	(0.0159)	(0.0284)	(0.0337)
Guarantees	0.6763***	0.6243***	0.7194***	0.6065***
	(0.0168)	(0.0184)	(0.0339)	(0.0302)
Low.D2Buffer × Guarantees	0.1308***	0.1394***	0.1177	0.2395***
	(0.0441)	(0.0527)	(0.0871)	(0.0918)
Firm FE	Yes	Yes		
Bank country FE	Yes	Yes	Yes	Yes
ILS FE			Yes	Yes
Control variables	Yes	Yes	Yes	Yes
Observations	978,055	417,343	2,348,622	1,348,854
R^2	0.6963	0.4591	0.3231	0.2911

Firm-level results

- Firms exposed to banks with low excess capital exhibit lower credit and lower headcount
- But public credit guarantee schemes supported those firms' credit

	ΔLog(borrowing)	ΔLog(borrowing)	Δlog(N.emplo)	Δlog(N.emplo)
Exp.Firm	-0.0254***	-0.0301***	-0.0076***	-0.0071***
	(0.0030)	(0.0034)	(0.0011)	(0.0013)
Exp.Firm × S.GUAR		0.0297***		-0.0033
		(0.0088)		(0.0024)
ILS FE	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes
Observations	1,038,844	1,038,844	1,038,844	1,038,844
R^2	0.42228	0.42229	0.10642	0.10642

Robustness checks

- Matching on capital requirements rather than capital ratio Table
- Using continuous excess capital instead of (matched) dummy Table
- Using only banks in bottom and top quartiles of excess capital Table
- Placebo test in 2019 Table

$\Rightarrow$ **Results are robust to all robustness checks**

Conclusion

- *Capital buffers* intend to make bank capital more countercyclical
- The COVID-19 tested this framework
- Banks with lower excess capital lent less during the COVID-19 pandemic
- Exposed firms were unable to fully replace the curtailed loans and reduced headcount
- Credit guarantee schemes were instrumental in reducing the negative effect of unwillingness to use buffers
- These findings raise concerns that the capital buffers introduced by Basel III may not be as countercyclical as intended.

Bibliography

BCBS.2011. Basel III: A global regulatory framework for more resilient banks and banking systems. Basel Committee on Banking Supervision, Bank for International Settlements.

BCBS. 2021. Evaluating the effectiveness of Basel III during the Covid-19 and beyond. Basel Committee on Banking Supervision, Bank for International Settlements.

Bertand, M., Duflo, E., Mullainathan, S. 2004. How much should we trust difference-in-differences. Quarterly Journal of Economics, 119, 249-275.

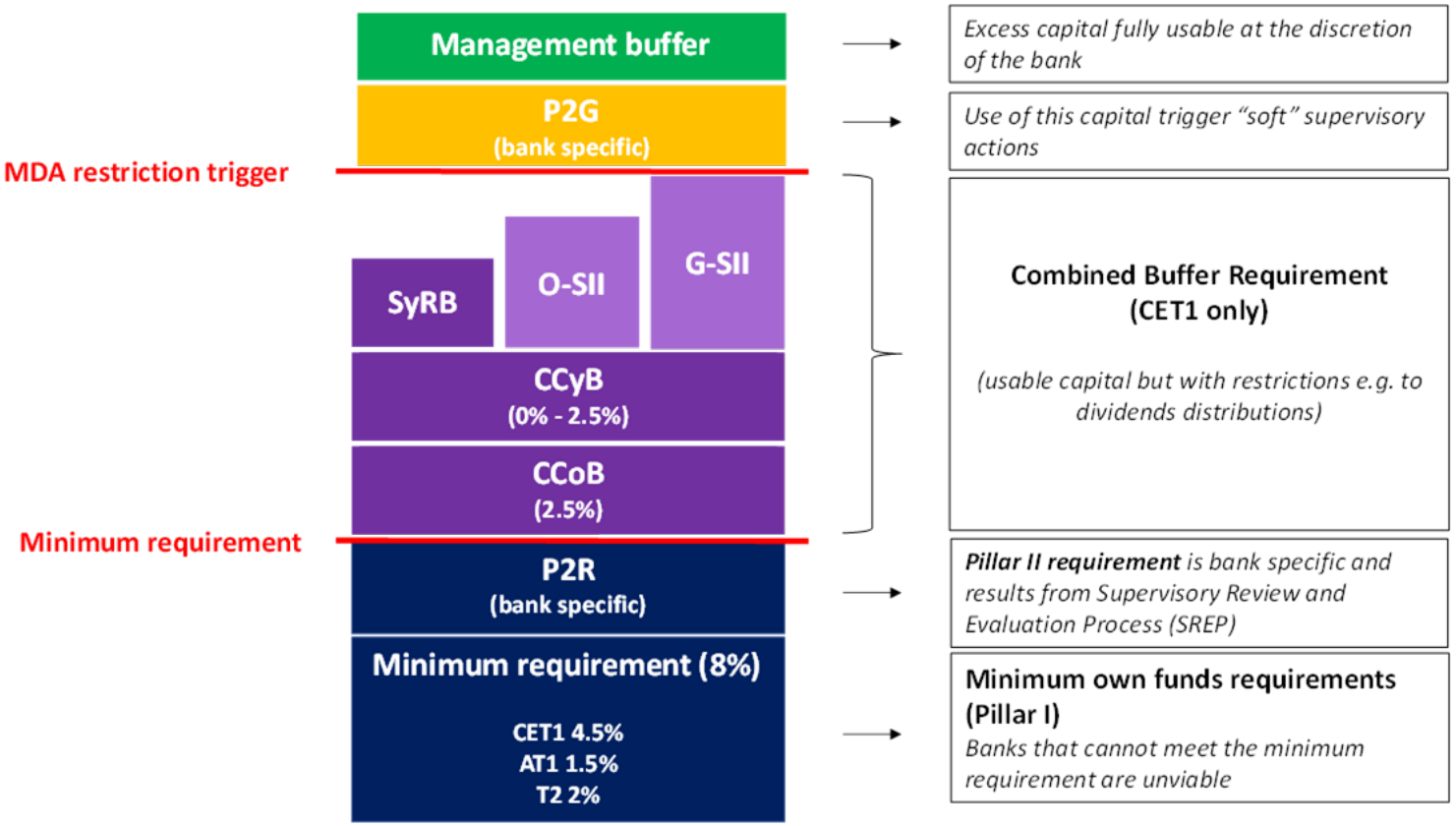
Degryse, H., De Jonghe, O., Jakovljevic, S., Mulier, K., Schepens, G. 2019. Identifying credit supply shocks with bank-firm data: Methods and applications. Journal of Financial Intermediation, 40, 100813.

FSB. 2020. Covid-19 pandemic: Financial stability implications and policy measures taken. Financial Stability Board.

IMF. 2021. Covid-19: How will European banks fare? IMF Departmental Papers, International Monetary Fund.

Khwaja, A. I., and Mian, A. 2008. Tracing the impact of bank liquidity shocks: evidence from an emerging arket." American Economic Review, 98, 1413-42.

Detailed stack of capital demand in the euro area



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Full list of control variables

- Bank controls: overall capital requirement (L.OCR), the logarithm of bank total assets (L.TA.log), the risk-weight density (L.RW), the ratio of debt securities-to-total assets (L.MKT FUNDING/TA), the net interest margins (L.NIM) the ratio of non-performing loans-to-gross loans (L.NPLs), the ratio of corporate forbearance-to-outstanding loans (L.FORBEARANCE), the ratio of cash and financial assets held for trading-to-total assets (L.LIQUID/TA), the share of non-interest income-to-operating income (L.DIVERS), the ratio of off balance sheet activities-to-total assets (L.OFF BS), the ratio of credit exposures-to-total assets (L.LOAN/TA), the cost-to-income ratio (L.CIR) and the ratio of provisions-to-total assets (L.PROVISION/TA)
- Policy controls: the ratio of targeted longer term refinancing operations (TLTROs III)-to-total assets, the ratio of dividend planned in 2019 but not paid in 2020-to-risk weighted assets (DIVIDEND.REST) (both variables at bank level) and two additional variables capturing the percentage of post-event credit from bank i to firm k that are subject to government moratoria (S.MORA) and guarantees (S.GUAR) that are computed at the bank-firm level

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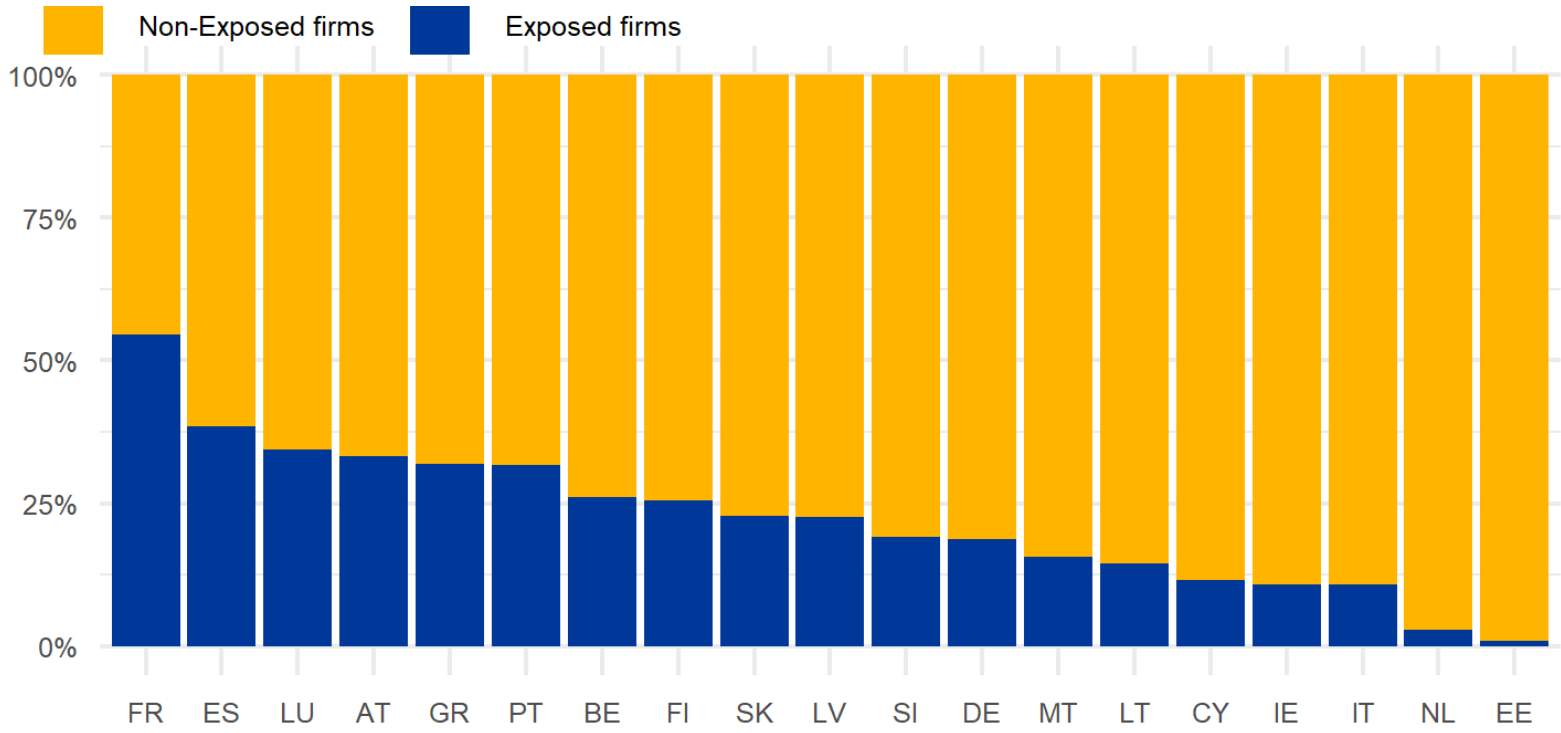
Share of exposed firms by country



Robustness capital

	Dependent variable: Δ Log (loans)			
	Unmatched Firm FE	Matched Firm FE	Unmatched ILS FE	Matched ILS FE
Low.D2Buffer	-0.0541***	-0.0760***	-0.0536**	-0.1070***
	(0.0164)	(0.0183)	(0.0248)	(0.0297)
Firm FE	Yes	Yes		
Bank country FE	Yes	Yes	Yes	Yes
ILS FE			Yes	Yes
Control variables	Yes	Yes	Yes	Yes
Observations	978,055	100,910	2,348,622	391,809
R^2	0.69950	0.74358	0.33346	0.36103

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Robustness continuous

	Dependent variable: Δ Log (loans)	
	Unmatched Firm FE	Unmatched ILS FE
L.Dist. CBR	0.5777***	0.2723
	(0.1817)	(0.2302)
Firm FE	Yes	
Bank country FE	Yes	Yes
ILS FE		Yes
Control variables	Yes	Yes
Observations	978,055	2,348,622
R^2	0.70029	0.33392

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Robustness Extremes quartile

	Dependent variable: Δ Log (loans)			
	Unmatched Firm FE	Matched Firm FE	Unmatched ILS FE	Matched ILS FE
Low.D2Buffer	-0.0491***	-0.0752***	-0.0568**	-0.0425**
	(0.0183)	(0.0254)	(0.0237)	(0.0169)
Firm FE	Yes	Yes		
Bank country FE	Yes	Yes	Yes	Yes
ILS FE			Yes	Yes
Control variables	Yes	Yes	Yes	Yes
Observations	214,867	64,532	1,052,407	478,172
R^2	0.74402	0.77924	0.36500	0.39334

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Robustness Placebo

	Dependent variable: Δ Log (loans)			
	Unmatched Firm FE	Matched Firm FE	Unmatched İLS FE	Matched İLS FE
Low.D2Buffer	-0.0048	-0.0218	0.0111	1.33×10^{-5}
	(0.0101)	(0.0169)	(0.0146)	(0.0262)
Firm FE	Yes	Yes		
Bank country FE	Yes	Yes	Yes	Yes
ILS FE			Yes	Yes
Control variables	Yes	Yes	Yes	Yes
Observations	1,004,489	389,662	2,295,397	1,302,733
R^2	0.64099	0.68361	0.13829	0.13435

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