



TO USE OR NOT TO USE?

CAPITAL BUFFERS AND LENDING DURING A CRISIS

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7TH ANNUAL WORKSHOP OF ESCB RESEARCH CLUSTER 3
NOV. 2023 | SAARISELKÄ



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MOTIVATION

1



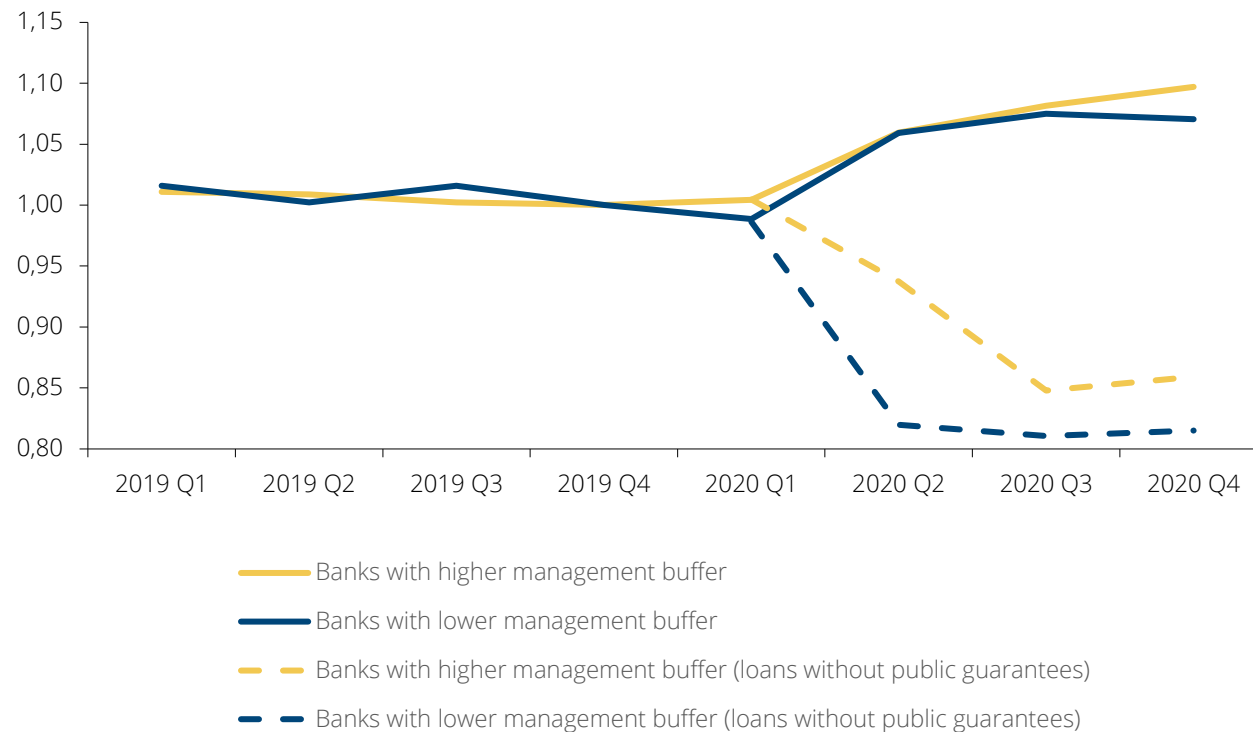
DESPITE THE ENCOURAGEMENT GIVEN BY THE AUTHORITIES TO THE USE OF THE BUFFERS, SOME FACTORS MAY IMPACT NEGATIVELY THIS USABILITY

- ❑ In the context of the Covid-19 shock, most macroprudential authorities encouraged the release of the countercyclical capital buffer at the onset of the pandemic crisis to make it possible for institutions to maintain an adequate capacity to finance the economy and to absorb potential losses.
- ❑ Complementarily, the ECB as a microprudential authority, communicated that it would be flexible in approving the capital conservation plans that the significant credit institutions, subject to its supervision, are legally obliged to present if they decide to operate temporarily below the level set for the combined buffer requirement (CBR).
- ❑ However, banks' willingness to draw down the CBR may be limited by several factors including limitation to distributions (according to the MDA mechanism), market stigma and the need to comply with other regulatory requirements, such as the leverage ratio and the Minimum Requirements for Own Funds and Eligible Liabilities (MREL).
- ❑ **By analyzing the behavior of a sample of Portuguese banks during the pandemic, the aim of this paper is to analyze whether banks with greater headroom above regulatory buffers lend more than banks with lower headroom during a crisis environment, taking also into account the relevance of the public guarantee scheme in lending in the pandemic context.**



THE IMPACT OF THE PUBLIC GUARANTEE SCHEME ON LENDING WAS RELEVANT IN THE PANDEMIC CONTEXT

- As of the second quarter of 2020, the Covid-19 shock appears to have had a stronger impact on the group of less capitalized banks when leaving out the public guaranteed loans.



This figure compares the normalised trends of the average bank-firm level change in lending between banks closer to the CBR and those with a high management buffer. Banks with a lower management buffer are in the first quartile in 2019q4.

Trends are normalised such that both variables take the value of 1 in 2019q4.



THE PANDEMIC CRISIS HAS MOTIVATED THE UPSURGE OF A NUMBER OF STUDIES REGARDING BUFFERS' USABILITY

- ❑ The deep economic recession, uncertainty and the expectation of a deterioration in bank asset quality and profitability caused by the pandemic provided a first and unique setting to test the capital framework, particularly in what regards buffers' release and their usability. This justifies the recent upsurge of a high number of studies handling this topic.
- ❑ One of the first studies was carried out by Avezum et al. (2020). Using a sample of European countries, the study shows that, in the face of a negative shock, buffer releases contributed, on average, to mitigate lower lending to households, specifically for small businesses and the purchase of own residences. Using a different methodology Dursun-de Neef et al. (2022) confirm that the release of the CCyB led to an increase in the average bank's lending as a percentage of its total assets.
- ❑ In the June 2021 Financial Stability Report of Banco de Portugal, a Special Feature analyses the impact of voluntary buffers on lending and average RW, using a sample of twenty Portuguese banks on a consolidated basis, for the period from the first quarter of 2019 to the fourth quarter of 2020. The results point out that banks with greater voluntary buffers increased the growth rate of credit to the non-financial private sector, especially the NFC sector. Additionally, Government-backed lending narrowed the differences between banks with different levels of voluntary buffers, making lending capacity to NFCs more homogeneous.
- ❑ Couallier et al. (2022) investigate euro area banks' willingness to make use of their capital buffers, focusing on the credit granted to NFCs and using ANACREDIT. They conclude that banks with little headroom above regulatory buffers reduced their lending relative to other banks. This result was also obtained for the US (Berrospide et al., 2022)



THIS PAPER IS THE FIRST TO INVESTIGATE SEVERAL FACTORS THAT COULD IMPACT BUFFERS' USABILITY

- ❑ The first finding of this paper is that banks with greater headroom above regulatory buffers lend more than banks with lower headroom during a crisis environment, i.e., if banks use, at least to some extent, their buffers.
- ❑ This effect is mostly driven by the extensive margin, banks with a higher management buffer are more likely to either grant credit to new firms or maintain the existing credit relationships.
- ❑ At the intensive margin, the effect of having a greater management buffer is weaker. This is explained by these banks being more likely to grant credit under the public guarantee scheme.
- ❑ Additionally, we find that market stigma hampers the use of buffers and that banks with a larger management buffer are less risk-averse during the crisis.
- ❑ Lastly, we also analyze the impact of capital headroom in other firms and loans' characteristics.
- ❑ To the best of our knowledge, this is the first paper that studies the heterogeneity of banks' use of buffers.



METHODOLOGY
AND DATA

2



THE ECONOMETRIC IDENTIFICATION FOLLOWS BERTRAND ET AL. (2004) AND KHWAJA AND MIAN (2008)

- ❑ The study is divided in two parts:
 - ❑ Bank-firm level analysis: how banks adjust their balance sheets after the pandemic outbreak, by analyzing the differences in the management buffer before the Covid-19 shock, and its interaction with public guarantees, market pressure, and other firm's characteristics.
 - ❑ Firm level analysis: how firms more exposed to banks with lower management buffer before the shock manage to raise funds from banks with greater management buffer to replace the lost lending.

- ❑ The quarterly data is collapsed into pre- (2019q2-2019q4) and post-pandemic shock (2020q2-2020q4) averages as suggested by Bertrand et al. (2004) to correct for the serial correlation in the error term.



□ Bank-firm level analysis

Baseline regression

$$\Delta(\text{credit})_{bf} = \alpha_f + \beta MB_b + \gamma X_b + \epsilon_{bf}$$

$\Delta(\text{credit})_{bf}$ is change in the credit granted by bank b to firm f , between the pre- and post-shock period.

MB_b is the management buffer prior to the pandemic shock.

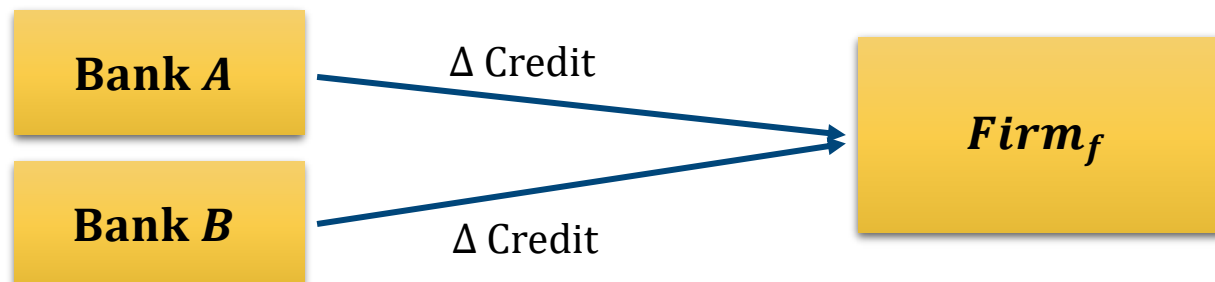
X_b are bank control variables.

α_f are firm fixed effects: firm fixed effects use multiple bank-firm relationships to control for firm credit demand (Khwaja and Mian, 2008). Single-bank lending relationships are absorbed by firm fixed effects. Nonetheless, single bank-lending relationships are included afterwards as a robustness test.

Regressions with interactions

$$\Delta(\text{credit})_{bf} = \alpha_f + \beta MB_b + \delta I + \theta MB_b * I + \gamma X_b + \epsilon_{bf}$$

I refers to either the use of public guarantees, market stigma, or firms' financial indicators.





□ Firm-level analysis

Baseline regression

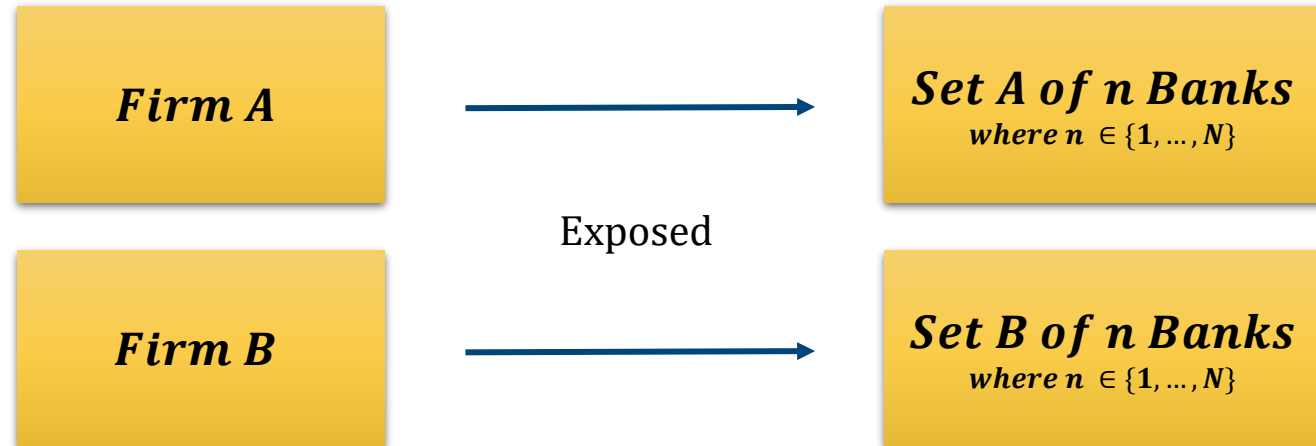
$$\Delta(F)_f = \alpha_{ils} + \beta MB_f + \gamma X_f + \epsilon_f$$

$\Delta(F)_f$ refers to the change over the pandemic shock in firm's credit and other firm's financial structure characteristics as sales, wage, employment, fixed assets, cash and financial assets.

MB_f is the management buffer prior to the pandemic shock, weighted by its loan volume to firm f prior to the shock over total bank loans taken by this firm.

X_f are bank control variables, weighted by its loan volume to firm f prior to the shock over total bank loans taken by this firm

α_{ils} are industry-location-size fixed effects.





THE QUARTERLY DATA IS COLLAPSED INTO PRE- (2019Q2-2019Q4) AND POST-PANDEMIC SHOCK (2020Q2-2020Q4) AVERAGES, FOLLOWING BERTRAND ET AL. (2004).

- ❑ The empirical analysis uses data at the loan, bank and firm level.

Data level	Source	Pre-pandemic shock	Post-pandemic shock
Loan level	CRC	2019q2-2019q4	2020q2-2020q4
Bank level	Banco de Portugal	2019q2-2019q4	-
Firm level	IES	2019q4	2020q4



		Data level	Source
$\Delta(\textit{credit amount})$	Change in credit over the pandemic shock	Loan level	Central Credit Register
$\Delta(\textit{credit conditions})$	Change in other credit conditions as interest rate, maturity and collateral		
<i>Public Guarantees %</i>	Share of bank-firm credit under the public guarantees scheme		
<i>Management Buffer</i>	Difference between the capital ratio and the overall capital requirement ratio	Bank level	FINREP/ COREP
<i>Market discipline</i>	Weight of the wholesale funding in total liabilities		
<i>Average RW</i>	Total risk-weighted assets to its total assets		
<i>OCR</i>	Overall capital requirement ratio		
<i>Size</i>	Logarithm of bank total assets		
<i>Provisions</i>	Provisions over total assets		
<i>Low Profitability</i>	Dummy=1 if firm's interest coverage ratio is higher than 0.5 or if EBITDA is negative	Firm level	Simplified Business Information (IES)
<i>High Leverage</i>	Dummy=1 if firm's leverage ratio is higher than 1		
<i>Most Affected Sectors</i>	Dummy=1 if firm's activity sector sales decrease over the pandemic shock is higher than the d th decile		
$\Delta(F)$	Change in other firm's financial structure characteristics as sales, wage, employment, fixed assets, cash and financial assets		



RESULTS

3



3.1 BANK-FIRM LEVEL ANALYSIS

3.1.1 Baseline regressions

	(1)	(2)	(3) Extensive margin		(5) Intensive margin
	Δ Credit	Δ Credit	Exit	Enter	Δ Credit
Management buffer	0.558*** (0.187)	1.527*** (0.182)	-0.489*** (0.0654)	0.187*** (0.0669)	0.214* (0.121)
Observations	265,944	265,944	233,956	211,336	181,722
R-squared	0.440	0.445	0.439	0.475	0.416
Controls	No	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

- The management buffer has a positive impact on the change of bank lending to NFCs.
- Considering the result in column 2, a one standard deviation increase in the management buffer (2.8 p.p.) leads to an increase in lending to NFCs of around 4.2 p.p..

- At the extensive margin, the management buffer decreases the probability of a bank not lending to a firm that it was lending to before the pandemic (column 3) and increases the probability of a bank lending to a firm that it previously was not lending to (column 4).
- Conversely, at the intensive margin, the effect of having a greater management buffer has a lower magnitude and is statistically significant only at the 10% level (column 5).
- However, given that the credit developments in Portugal cannot be dissociated from the role of the public guarantees scheme in response to the COVID-19 pandemic, we proceed with an analysis of the interaction between capital buffers and public guarantees.



3.1 BANK-FIRM LEVEL ANALYSIS

3.1.2 Interacting the management buffer with public guarantees

	(1)	(2)	(3) Extensive margin		(5) Intensive margin
	Δ Credit	Δ Credit	Exit	Enter	Δ Credit
Management buffer	0.809*** (0.149)	1.795*** (0.187)	-0.499*** (0.0681)	0.182*** (0.0671)	0.614*** (0.108)
Public guarantees %	0.872*** (0.0478)	0.838*** (0.0452)	-0.175*** (0.00554)	0.0587*** (0.0100)	0.515*** (0.0373)
Management buffer × Public guarantees %	-0.00401 (0.967)	0.737 (0.942)	-1.339*** (0.141)	0.659*** (0.246)	-2.815*** (0.727)
Observations	265,944	265,944	233,956	211,336	181,722
R-squared	0.474	0.477	0.454	0.478	0.439
Controls	No	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes

- The effect of the management buffer on lending has the expected sign and is significantly different from zero in all columns.
- For the overall effect (columns 1 and 2), we do not observe a difference in the effect of the management buffer between loans with or without public guarantees. This is because, while the interaction reinforces the effect at the extensive margin, it mitigates at the intensive margin.
- The effect of the public guarantee scheme is as expected in all margins. Having a public guarantee associated with the loan decreases the probability of not lending (column 3), increases the probability of a bank creating a new credit relationship (column 4), and increases the growth rate of lending from banks from which firms were already borrowing (column 5).
- The results in Column 5 indicate that among loans under the public guarantee scheme banks with a lower management buffer lent more than banks with a greater management buffer.



3.1 BANK-FIRM LEVEL ANALYSIS

3.1.3 Understanding the interaction with public guarantees

	(1)	(2)	(3) Intensive margin
	Public guarantees %		
Management buffer	-0.288*** (0.0794)	-0.361*** (0.0888)	-0.520*** (0.102)
Observations	265,944	265,944	181,722
R-squared	0.443	0.468	0.488
Controls	No	Yes	Yes
Firm FE	Yes	Yes	Yes

- To better understand the sign of the interaction term for the intensive margin, we split the sample into loans with and without guarantees.
- The table shows that banks with lower management buffers were more likely to lend under the public guarantees scheme.

- Together our results suggest that, on the one hand, banks with a lower management buffer might have resorted to public guarantees to keep credit relationships and their market share at the cost of the lower expected profitability associated with public-guaranteed loans considering the low risk associated with this type of loans (Mateus and Neugebauer, 2022).
- On the other hand, banks with a higher capital headroom could afford to maintain their level of risk-taking and rely less on public-guaranteed loans.
- Mateus and Neugebauer (2022) also show that banks were more likely to extend credit under public guarantees for firms they were already lending to, which helps explain why the interaction between public guarantees and capital buffer is only significant for the intensive margin.



3.1 BANK-FIRM LEVEL ANALYSIS

3.1.4 Interacting the management buffer with market discipline

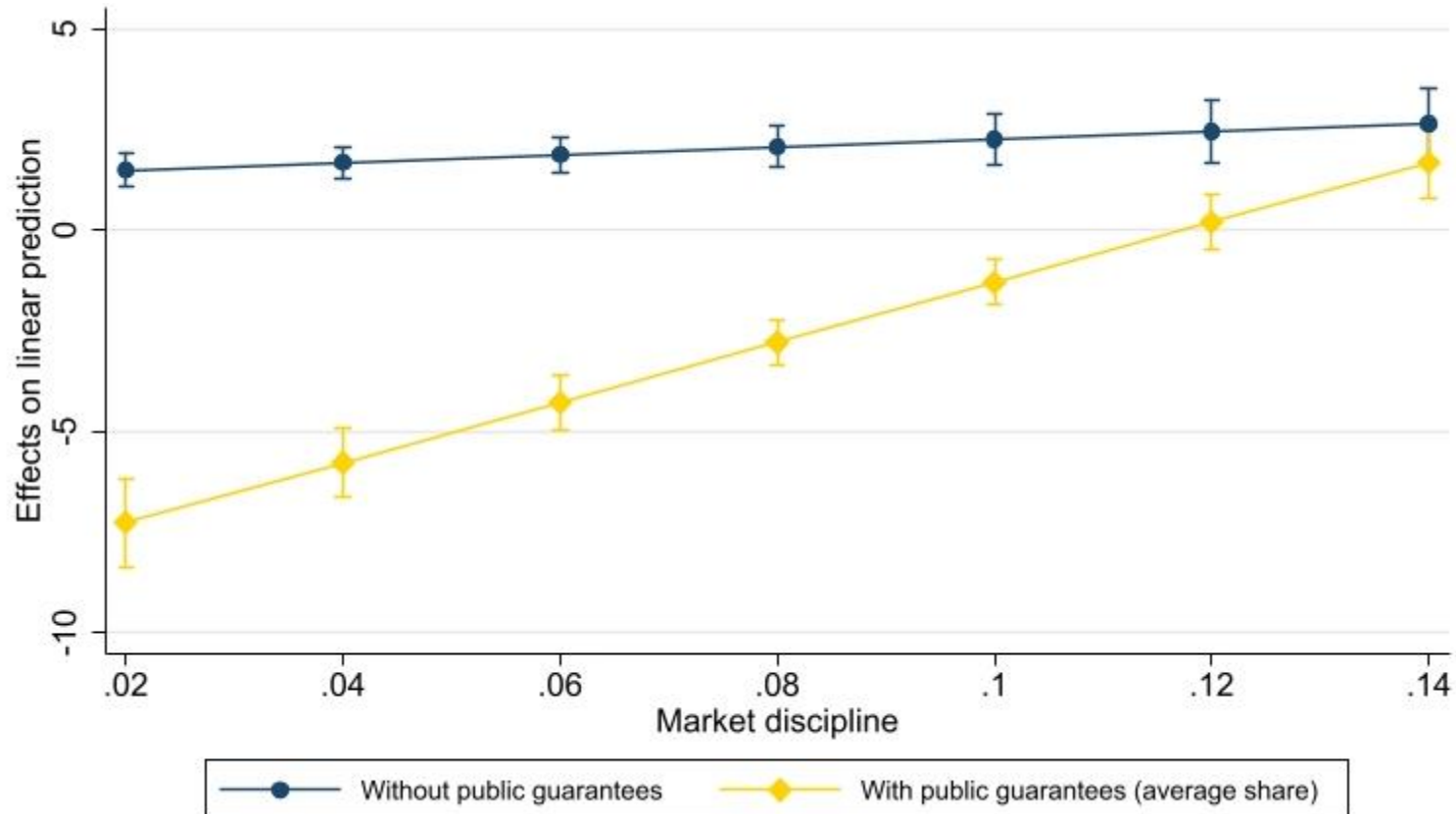
	(1)	(2)
	Δ Credit	
Management buffer	2.201*** (0.277)	1.340*** (0.245)
Market discipline	-1.723*** (0.289)	-2.963*** (0.275)
Management buffer × Market discipline	-11.51** (5.347)	12.04*** (4.324)
Public guarantees %		0.449*** (0.0952)
Management buffer × Public guarantees %		-72.68*** (7.150)
Public guarantees % × Market discipline		12.16*** (0.994)
Management buffer × Public guarantees % × Market discipline		427.8*** (49.44)
Observations	265,944	265,944
R-squared	0.445	0.482
Controls	Yes	Yes
Firm FE	Yes	Yes

- It is important to account for the public guarantees to estimate the effect of the market discipline because this effect appears to be only relevant on the intensive margin.
- The effect of the management buffer is stronger for banks under greater market pressure.
- Furthermore, higher levels of market discipline narrow the difference in the effects between bank-firm relationships not under public guarantees and those covered by this support program.



3.1 BANK-FIRM LEVEL ANALYSIS

3.1.4 Interacting the management buffer with market discipline



- The positive slope of both lines shows that the incentive of banks with lower management buffers to lend is weaker the higher the market discipline is.
- Furthermore, higher levels of market discipline narrow the difference in the average marginal effects between bank-firm relationships not under public guarantees and those covered by this support program (at the average level).



3.1 BANK-FIRM LEVEL ANALYSIS

3.1.5 Interacting the management buffer with firm's financial indicators

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ Credit					
Management buffer	1.224*** (0.210)	0.925*** (0.214)	0.813*** (0.204)	0.741*** (0.238)	1.344*** (0.212)	1.352*** (0.213)
Low profitable		-0.219*** (0.0141)				
Management buffer × Low profitable	0.927*** (0.258)	0.871*** (0.255)				
High leverage				-0.443*** (0.0262)		
Management buffer × High leverage			2.958*** (0.381)	2.573*** (0.484)		
Most affected sectors: Management buffer × Above median					0.520 (0.348)	
Management buffer × 10th decile						1.812*** (0.562)
Management buffer × 9th decile						0.596* (0.334)
Management buffer × 8th decile						0.612 (0.944)
Management buffer × 7th decile						0.164 (0.489)
Management buffer × 6th decile						-0.0839 (0.681)
Observations	216,932	370,682	265,944	488,878	265,944	265,944
R-squared	0.434	0.072	0.446	0.078	0.445	0.445
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	No	Yes	No	Yes	Yes
Industry-location-size FE	-	Yes	-	Yes	-	-

- The results indicate a weaker credit supply at the onset of the pandemic for firms that were low profitable (column 2) or highly leveraged before the Covid-19 shock (column 4).
- The results indicate that banks with a higher buffer supported more firms that were vulnerable before the Covid-19 shock.
- Columns 5 and 6 show that the effect of capital buffers is stronger only for the most adversely affected sectors (those with sales growth decrease on the 10th decile).

Notes: Low profitable firm: dummy equal to 1 if firm's interest coverage ratio is higher than 0.5 or if EBITDA is negative in 2019q4. Leverage ratio > 1: dummy equal to 1 if the firm's leverage ratio is higher than 1 in 2019q4.



3.1 BANK-FIRM LEVEL ANALYSIS

3.1.6 Impact on other loan characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ Interest rate		Δ Maturity		Δ Collateral	
Management buffer	-1.314*** (0.402)	-1.003*** (0.376)	0.409 (0.315)	1.143*** (0.260)	-0.913*** (0.329)	-1.788*** (0.282)
Public guarantees %		-0.505*** (0.0692)		1.075*** (0.0933)		-0.274*** (0.0533)
Management buffer × Public guarantees %		-12.77*** (1.881)		-2.739 (1.868)		15.47*** (1.317)
Observations	182,584	182,584	182,584	182,584	182,584	182,584
R-squared	0.413	0.423	0.433	0.467	0.394	0.398
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes

- Columns 1 and 2 indicate that banks with greater capital headroom charge lower interest rates.
- Column 2 also shows that loans under public guarantee have lower interest rates and the management buffer reinforces this effect.
- Column 4 shows that banks with greater capital headroom or lending under a public guarantee scheme lend loans with longer maturity.
- Conversely, columns 5 and 6 show that banks with greater capital headroom or lending under a public guarantee scheme ask for less collateral. However, the higher the management buffer the weaker the effect of the public guarantees on the collateral.



3.2 FIRM LEVEL ANALYSIS

	(1) Credit	(2) Wage	(3) Employment	(4) Sales	(5) Cash
Management buffer	0.912*** (0.0767)	0.110* (0.0652)	0.100* (0.0527)	-0.0943 (0.0692)	-0.165 (0.103)
Observations	271,584	187,158	199,025	204,625	205,817
R-squared	0.030	0.028	0.019	0.052	0.011
Controls	Yes	Yes	Yes	Yes	Yes
Industry-location- size FE	Yes	Yes	Yes	Yes	Yes

- The management buffer still maintains a positive and statistically significant coefficient, suggesting that firms cannot completely offset the impact of lower credit supply from banks with lower capital headroom by lending from banks with greater capital buffers.
- Firms most exposed to banks with greater capital headroom had a higher growth rate of their wage bill and employment during the pandemic period.
- These firms also appear to have a higher growth rate of financial assets at the expense of a lower growth rate of fixed assets.



FINAL CONSIDERATIONS

4



4. FINAL CONSIDERATIONS

- Among credit relationships not covered by the public guarantees scheme, banks with higher capital headroom lend more to NFCs over the pandemic shock. This effect is driven by the extensive margin, banks with higher management buffer are more likely to either grant credit to new firms or maintain them.
- At the intensive margin, the effect of having a greater management buffer is weaker. This is explained by these banks being more likely to grant credit under the public guarantee scheme.
- These baseline findings are robust to:
 - the inclusion of (i) single-relationship borrowers, (ii) uncommitted loans, or (iii) the share of credit under moratoria as a control variable;
 - the replacement of the main variable of interest Management Buffer by (iv) the Voluntary Buffer, (v) both components (Voluntary Buffer and Pillar 2 Guidance), or (vi) a dummy variable that equals 1 for banks with a management buffer below the 25th percentile, to conceal the possibility that the relation between the management buffer and lending is non-linear.
- Market pressure mitigates the incentive of banks with lower capital headroom to use public guarantees to increase lending.
- The results indicate a weaker credit supply at the onset of the pandemic for riskier firms. However, capital headroom mitigated this effect.
- Finally, in the firm-level analysis, we do not find that credit substitution offsets the impact of the management buffer at the firm level.

The background is a photograph of a classical architectural facade, likely a doorway or window. It features two columns with decorative capitals, each topped with a spiral volute. Between the columns and above them are rows of arched and rectangular moldings. The overall color palette is a warm, muted brown or olive green. The text "THANK YOU" is centered in the lower right portion of the image.

THANK YOU