

Macprudential Policies and Corporate Tangible and Intangible Investment: Evidence from EIBIS Data

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- Since GFC, **macroprudential policies (MaPs)** have become key tools for policymakers to ensure financial stability.
- Regulations, through shaping bank lending behavior, can directly impact firms' ability to invest, ultimately influencing productivity, job creation, and innovation.
- However, the real effect of MaPs on firm-level investment remains underexplored, especially the distinction between **tangible and intangible investments**.

- Macroeconomic impact of MaPs:
Claessens et al. (2015), Kuttner and Shim (2016), Cerutti et al. (2017), Cizel et al. (2019), Forbes (2021), Alam et al. (2024)
The counter-cyclical nature and short-term cost of MaPs:
Borio and Shim, (2007), Brunnermeier et al. (2009), Richter et al. (2019), Mendicino et al. (2020)
- Specific prudential tools, Bank lending, bank- and firm-level effects:
Jiménez et al. (2017), Gropp et al. (2019), Degryse et al. (2023), Altavilla et al. (2020)
- Tangible vs intangible investment: Corrado & Hulten (2010), Grundy and Verwijmeren (2020)
Banks' limited role: Dell'Ariccia et al. (2021), Beck et al. (2023)
Policy: Döttling and Ratnovski (2023), Draghi (2024)

Key Questions

- 1 Does MaPs affect corporate investment?
- 2 If yes, what is the transmission mechanism?
- 3 How do types of investment—**tangible vs. intangible**—respond to MaP shocks?

A Preview of Our Findings

- MaP tightening **significantly reduces corporate investment**, driven by a contraction in bank credit supply.
- Effects are more pronounced for **financially weak firms** and for those borrowing from **less-capitalized banks**.
- The decline is concentrated in **tangible capital investment**; intangible investment remains largely unaffected.

Data: A Unique Matched Dataset (2015-2022)

We construct a rich micro-macro dataset for 29 countries (EU27+UK+US).

Firm-Level Data

EIBIS Survey:

- Direct quantitative data on tangible (PPE) and intangible investment (R&D, software, data, employees training, and organizational capital).
- Detailed qualitative firm finance information: use of financing sources, measures of bank credit constraints, bank name.

Policy & Bank Data

iMaPP Database:

- IMF data on 17 MaP tools. Categorical indices, coded as 1 for a tightening action, 0 for no change, and -1 for a loosening action.

BankFocus:

- Bank balance sheet data, matched to firms.

Table: Classification of MaPs

Abbreviation	Name	Demand/ Supply	Activity/Entity-Based	Target
CCB	Countercyclical capital buffer	Supply	Entity	Capital
Conservation	Capital conservation buffer	Supply	Entity	Capital
Capital	Capital requirements	Supply	Entity	Capital
LVR	Leverage ratio	Supply	Entity	General
LLP	Loan loss provisioning requirements	Supply	Entity	Loan
LCG	Limits on credit growth	Supply	Activity	Loan
LoanR	Loan restrictions	Supply	Activity	Loan
LFC	Limits on foreign currency lending	Supply	Activity	General
LTV	Loan-to-value ratio limits	Demand	Activity	Loan
DSTI	Debt-to-income / service ratio limits	Demand	Activity	Loan
Tax	Taxes and levies	Supply	Entity	General
Liquidity	Liquidity requirements (e.g. LCR, NSFR)	Supply	Entity	General
LTD	Loan-to-deposit ratio limits	Supply	Activity	Loan
LFX	FX exposure and position limits	Supply	Activity	General
RR	Reserve requirements	Supply	Entity	General
SIFI	Surcharges for systemically Important Financial Institutions (SIFIs)	Supply	Entity	Capital

Identification: Exogenous MaP Shocks

MaP changes are not random. They respond to credit cycle. Two-step approach to identify MaP shocks as changes in policy that are orthogonal to macro conditions (Auerbach and Gorodnichenko, 2012), Altavilla et al. (2020).

1 Step 1: Purge Macro-Forecastable Component

For each country, we regress the MaP stance on its lags and lags of GDP and credit growth:

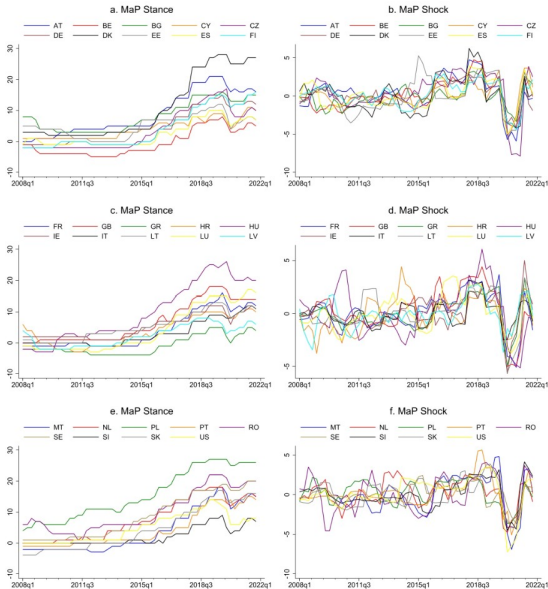
$$MaPstance_{c,t} = \alpha_c + \beta Z_{c,t-1} + \mathbf{u}_{c,t}$$

2 Step 2: Use Residuals as Shocks

The residuals ($MaP_{shock} = u_{c,t}$) are our **exogenous MaP shocks**, which we use in the main investment regression:

$$Y_{f,s,c,t} = \alpha_f + \theta_{s,t} + \beta MaP_{shock,c,t-1} + \gamma X_{f,s,c,t-1} + \epsilon_{f,s,c,t}$$

MaP Stances Versus MaP Shocks



Result 1: MaP Shocks Reduce Corporate Investment

	Dependent variable: Corporate investment			
	(1)	(2)	(3)	(4)
ΔMaP_{stance}	-0.0146** (0.0059)		-0.0164*** (0.0058)	
MaP_{shock}		-0.0226** (0.0091)		-0.0236*** (0.0087)
Firm controls			✓	✓
Fixed Effects	✓	✓	✓	✓
Observations	32,976	32,976	32,976	32,976

- A tightening in MaPs leads to a significant decline in corporate investment.
- Using exogenous shocks (col. 4), the effect is economically large and robust to controls.

Result 2: Supply-Based vs Demand-Based MaPs

The investment decline is entirely driven by **supply-based MaPs** (targeting banks).

	Dependent variable: Corporate Investment		
	(1)	(2)	(3)
MaP^{supply} <i>shock</i>	-0.0246*** (0.0086)		-0.0246*** (0.0083)
MaP^{demand} <i>shock</i>		-0.0025 (0.0170)	0.0004 (0.0159)
Firm controls	✓	✓	✓
Fixed Effects	✓	✓	✓
Observations	32,976	32,976	32,976

- The coefficient on supply-side shocks is negative and significant.
- Demand-side MaP shocks have no statistically significant effect on corporate investment.

Result 3: The Bank Lending Channel (Part 1)

Understanding the Channel with Fixed Effects

Strategy

If the effect disappears when we control for all time-varying bank-specific factors, the channel must run through banks.

	Dependent variable: Corporate Investment		
	(1)	(2)	(3)
MaP_{shock}	-0.0280** (0.0137)	-0.0413** (0.0185)	0.0269 (0.0838)
Firm FE	✓	✓	✓
Bank FE	✓	✓	✓
Firm-Bank FE		✓	✓
Bank-Year FE			✓
Observations	12,563	8,135	7,531

- The effect of MaP_{shock} is significant with firm-bank fixed effects (Column 2).
- It becomes **statistically insignificant** once we add Bank-Year fixed effects (Column 3), which absorb all bank-level credit supply shocks.

Result 4: The Bank Lending Channel (Part 2)

Heterogeneity by Bank Characteristics

The negative investment effect is weaker for firms borrowing from larger, better-capitalized banks.

	Dependent variable: Corporate Investment			
	(1)	(2)	(3)	(4)
MaP_{shock}	-0.0413** (0.0185)	-0.0358* (0.0209)	-0.0344* (0.0184)	-0.0341* (0.0184)
$MaP_{shock} \times ROA$		0.1020** (0.0447)		
$MaP_{shock} \times \text{Bank size}$			0.0054** (0.0023)	
$MaP_{shock} \times \text{Tier 1 Ratio}$				0.0306** (0.0120)
Firm-Bank FE	✓	✓	✓	✓
Observations	8,135	6,414	6,414	6,414

The positive and significant interaction terms show that stronger bank characteristics mitigate the negative impact of a MaP shock.

Result 5: The Bank Lending Channel (Part 3)

Firm access to bank finance

	Constrained	Dissatisfied with ...			
		Size	Price	Maturity	Collateral
MaP_{shock}	0.0014*** (0.0005)	0.0079** (0.0040)	0.0011 (0.0056)	0.0007 (0.0066)	0.0010 (0.0052)
Firm controls	✓	✓	✓	✓	✓
Macro controls	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓
Observations	32,976	14,266	14,266	14,266	14,266

- **Access tightens:** MaP shock raises the likelihood a firm is *constrained*.
- **Amount offered shrinks:** dissatisfaction with loan *size* rises.
- **Other terms unaffected:** effects on price, maturity, and collateral are small and statistically insignificant.

Result 6: Heterogeneity by Firm Characteristics

The investment decline is stronger for financially weaker firms.

	Dependent variable: Corporate Investment		
	(1)	(2)	(7)
MaP_{shock}	-0.0173* (0.0087)	-0.0252*** (0.0088)	-0.0240*** (0.0096)
$MaP_{shock} \times EFD$	-0.0096** (0.0042)		
$MaP_{shock} \times SA \text{ index}$		0.0110* (0.0056)	
$MaP_{shock} \times \text{Fixed assets}$			0.0092** (0.0039)

- The effect is stronger for firms with higher External Finance Dependence (EFD).
- The effect is weaker for firms with better access to finance (higher SA index) and more pledgeable assets (higher fixed assets).

Result 7: Heterogeneity by Firm Size

	Dependent variable: Corporate investment			
	Micro Firms	Small Firms	Medium Firms	Large firms
	(1)	(2)	(3)	(4)
MaP _{shock}	-0.0023 (0.0162)	-0.0525*** (0.0170)	-0.0319** (0.0159)	-0.0009 (0.0195)
Observations	9012	8807	7832	4804

Note: Turnover: micro (0-2M), small (2-10M), medium (10-50M), large (50M+).

- The effect is more pronounced among small and medium firms.

Decomposition: Tangible vs. Intangible Investment

Key Finding

MaP tightening causes a significant decline in **tangible investment**, but has **no statistically significant effect** on intangible investment.

	Total Inv. (1)	Tangible Inv. (2)	Intangible Inv. (3)
<i>MaP_{shock}</i>	-0.0236*** (0.0087)	-0.0856*** (0.0243)	-0.0074 (0.0164)

Why the Difference?

- **Financing Sources:** Tangible investments are typically financed externally, while intangible investments rely more on internal funds.
- **Collateral Value:** Tangible assets can be pledged as collateral, but intangible assets have limited pledgeability.

Conclusion and Policy Implications

Summary of Findings

- MaP tightening reduces corporate investment.
- The effect is transmitted primarily through **bank lending channel**.
- The investment decline is concentrated in **tangible capital**.

Policy Implications

- MaPs appear to enhance financial stability, as weaker firms and banks are affected more.
- However, MaPs also significantly dampen investment activity, and almost completely through SMEs.
- **Is this trade-off justifiable?** While financial stability is a critical goal, undermining the investment of SMEs can hinder long-term growth, innovation and employment, raising concerns about the broader economic cost.