EUROPEAN CENTRAL BANK

EUROSYSTEM

Do firms listen when the ECB speaks? The impact of monetary policy on firms' bank loans expectations

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Motivation

- **Research on how firms form expectations and whether monetary policy can influence them is receiving increasing attention**

  Central banks' goal to maintain price stability → (also) depends on firms' decisions → (also) depend on firms' expectations about economic conditions → (also) depend on MP and variables directly affected by CBs

- **Very limited empirical literature relating MP to firms' expectations**

  Enders, Hunnekes and Muller, JME 2019; Bottone and Rosolia, 2019; Emenidou & Zachariadis, JIMF 2022, Di Pace, Mangiante and Masolo, JME 2024

- **Even less papers focusing on MP and credit access expectations**

  Dunkelberg and Scott, BE 2009; Ferrando, Popov and Udell, EER 2022

The paper in a nutshell

- **We look at the impact of MP shocks on firms' bank loan expectations**
  - Euro area firm level survey data on availability of finance gathered from the ECB/EC Survey on the access to finance of enterprises (**SAFE**)
  - We use **daily information** on the exact day in which firms reply to the survey **to identify the impact of MP shocks**
  - **MP shocks** constructed using a high frequency identification technique (Nakamura and Steinsson, QJE 2018, Altavilla et. Al., JME 2019)

- **MP has a significant effect on expectations.** This impact:
  - Depends on the overall level of expectations, and whether they are decreasing
  - Non-linear, asymmetric
  - Depends on the type of MP shocks
  - Is heterogeneous along firms' characteristics

Survey on the access to finance of enterprises (SAFE)

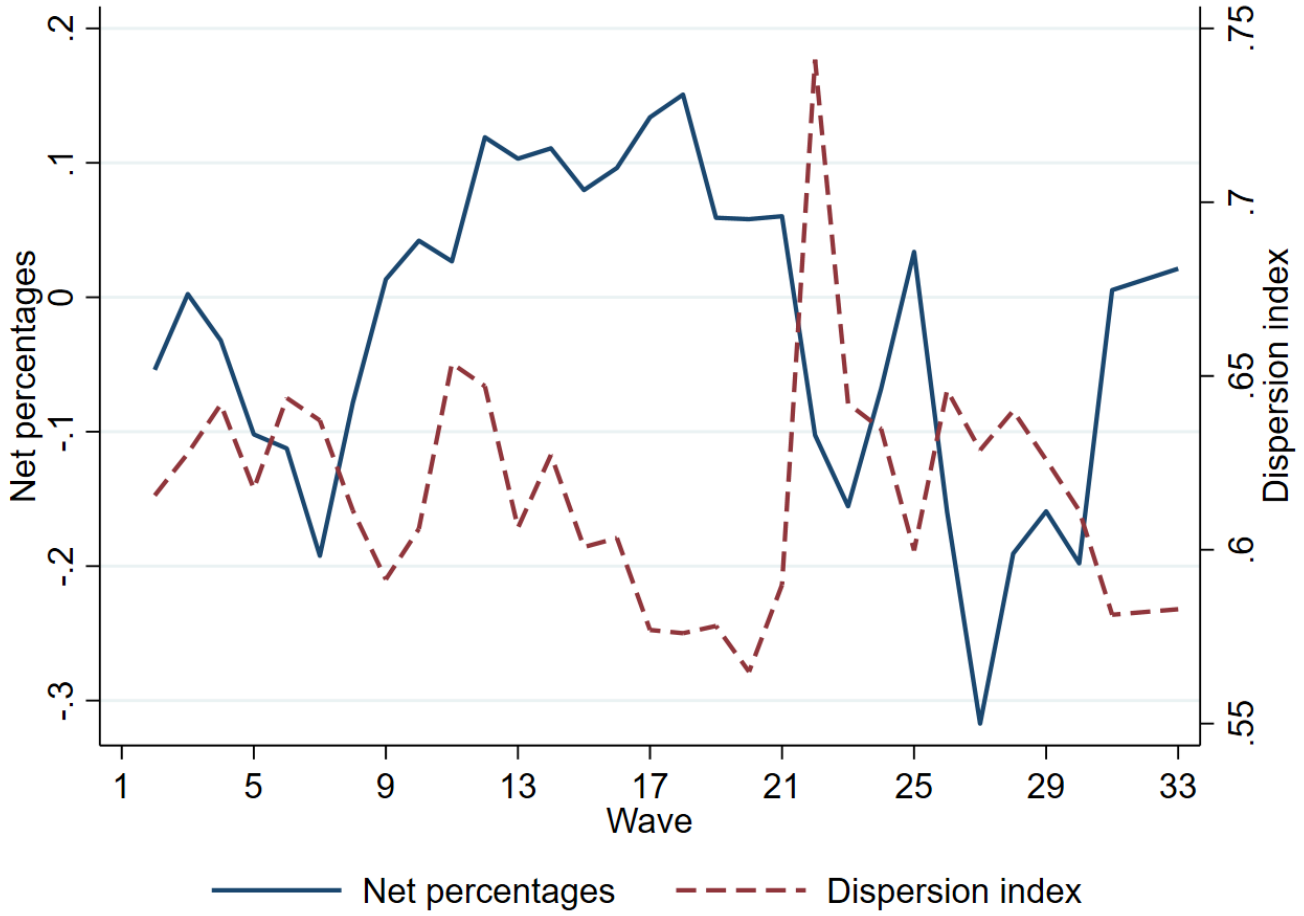
- **A bi-annual euro area firm-level survey**
  - In Spring ~12.000 EA firms; in Autumn ~ 17.000 EU firms
  - Mainly qualitative answers / directional (improvement/ no changes / deterioration)
  - Sample covers micro, small, medium and, to a lesser extent, large companies

- **In this paper** we use data from:
  - April 2009 - September 2024
  - 11 euro area countries (AT, BE, DE, ES, FI, FR, GR, IE, IT, NL and PT)

- **Detailed information on firms'**
  - **Structural characteristics** (ownership structure, age, size)
  - **Expectations about financing** (bank loan and other sources of funds)
  - **Financial position** (changes in debt/asset, turnover, profit, bank loan availability)
  - **Factors affecting credit** (changes in own capital, own outlook, credit history, financing constraints, general economic outlook, public support)
  - **Real decisions** (investment and number of employees)

Our variable of interest: firms' bank loan expectations

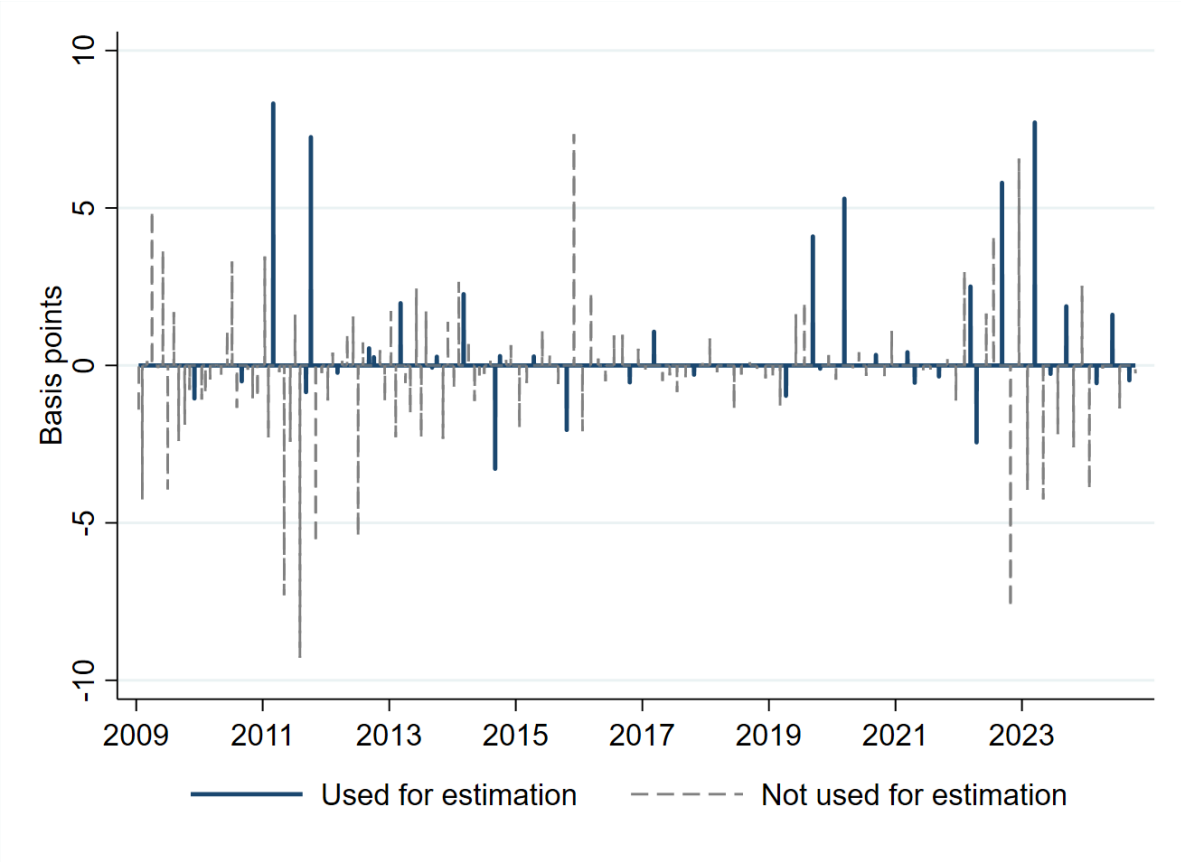
Firms' bank loan expectations: net percentages and dispersion over time



Notes: net percentages are calculated as the difference between the percentage of enterprises reporting an increase and the percentage reporting a decrease in bank loans expectations. The dispersion index is calculated as the cross-sectional weighted standard deviation of the survey responses. Source: ECB and European Commission SAFE.

- **Negative correlation** between net percentages and the dispersion index

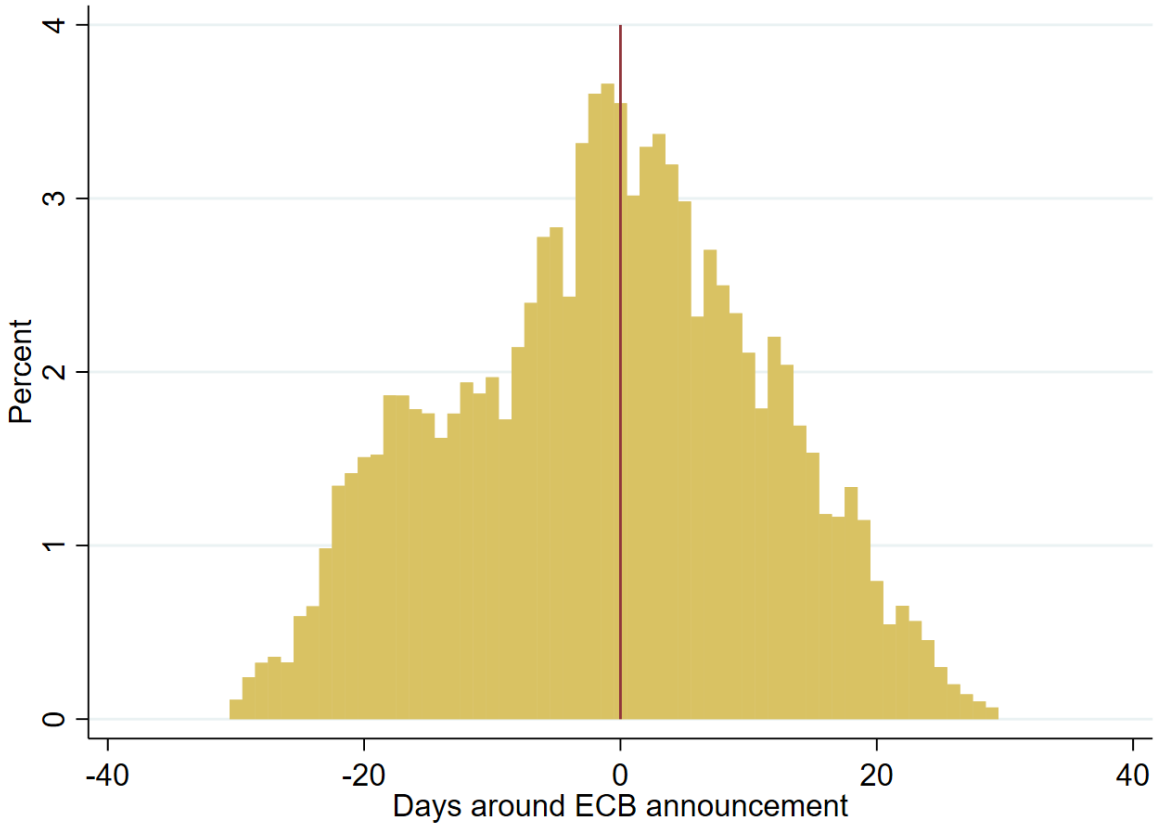
Construction of monetary policy shocks



- MP shocks constructed as **first principal component** of the intra-daily change in 7 OIS rates (1m to 10y) around ECB GovC scheduled announcements (see, among the others, Nakamura and Steinsson, 2018; Altavilla et al., 2019)
- Positive values correspond to contractionary shocks

Monetary policy identification: exploiting SAFE's daily information

Distribution of daily responses to the SAFE around ECB's announcement days



Notes: distribution of daily responses of firms around ECB's monetary policy announcements across survey rounds. Sample period from 2009 to 2023. Source: ECB and European Commission SAFE.

- We compare firms' expectations **in a narrow window around ECB announcements** (±4 working days)

Baseline specification

$$Y_{i,t} = \beta_0 + \boldsymbol{\beta_1} D_{i,m} \varepsilon_m + \beta_2 X_{i,t} + \alpha_{c,t} + \gamma_{s,t} + \delta_d + u_{i,t}$$

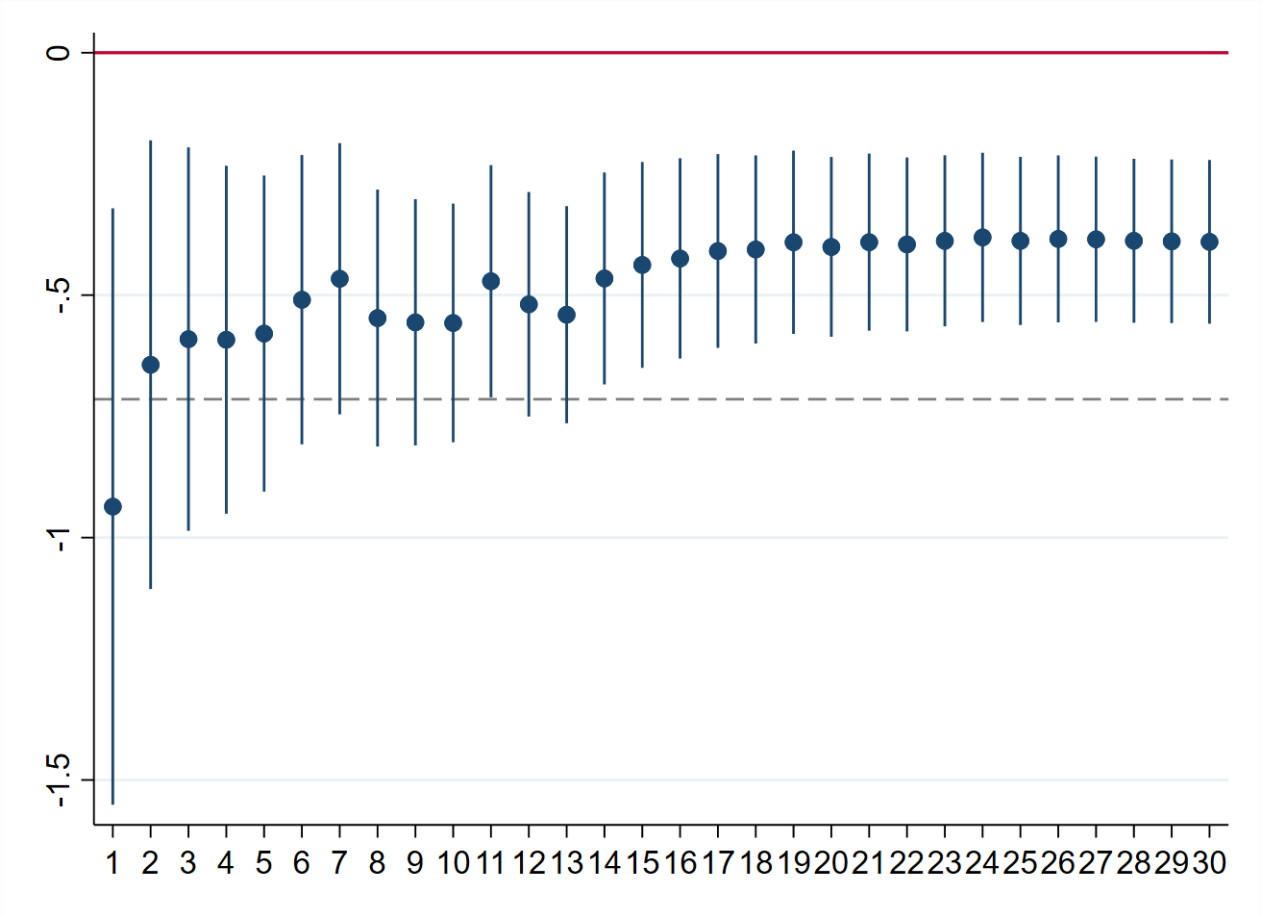
- $\boldsymbol{Y_{i,t}}$: Firms' bank loan expectations
  - either **trichotomous** (improvement/ no changes / deterioration) or **binary** (improvement/ deterioration)
- $\boldsymbol{D_{i,m}}$: dummy equal to 1 if firm *i* responded in the 4 days after the MP announcement; 0 if the 4 days prior to the MP announcement
- $\boldsymbol{\varepsilon_{,m}}$: MP shock
- $\boldsymbol{X_{i,t}}$: firm-level controls
- $\boldsymbol{\alpha_{c,t}, \gamma_{s,t}, \delta_d}$: country-wave, sector-wave, and days FEs
- OLS estimates with standard errors clustered at firm level

MP shocks have a significant impact on firms' bank loan expectations...

	Dep variable: firms' bank loan expectations				
	Trichotomous				Binary
	(1)	(2)	(3)	(4)	(5)
MP	-0.715***	-0.726***			-0.645**
	(0.237)	(0.248)			(0.253)
MP x expect. below the median			-0.783***		
			(0.267)		
MP x expect. above the median			–0.446		
			(0.500)		
MP x decreasing expect.				-0.864***	
				(0.256)	
MP x increasing expect.				0.001	
				(0.516)	
Constant & controls	yes	yes	yes	yes	yes
Country-Wave FE	yes	yes	yes	yes	yes
Sector-Wave FE	yes	yes	yes	yes	yes
Day FE	yes	yes	yes	yes	yes
Observations	37206	35015	37206	37206	37206
Adjusted R^2	0.208	0.208	0.208	0.208	0.366

- MP shocks have **significant impact on firms' bank loan expectations**…
- … but only if expectations are **not too high/too low** or are **decreasing**

… also when considering an expanding windows around ECB announcements



Notes The estimation sample is expanded to include a window from 1 to 30 days before and after the announcement days. Blue vertical lines indicate 90% confidence bounds

- **MP shock impact** seems to be **stronger** on the **first day** after announcement

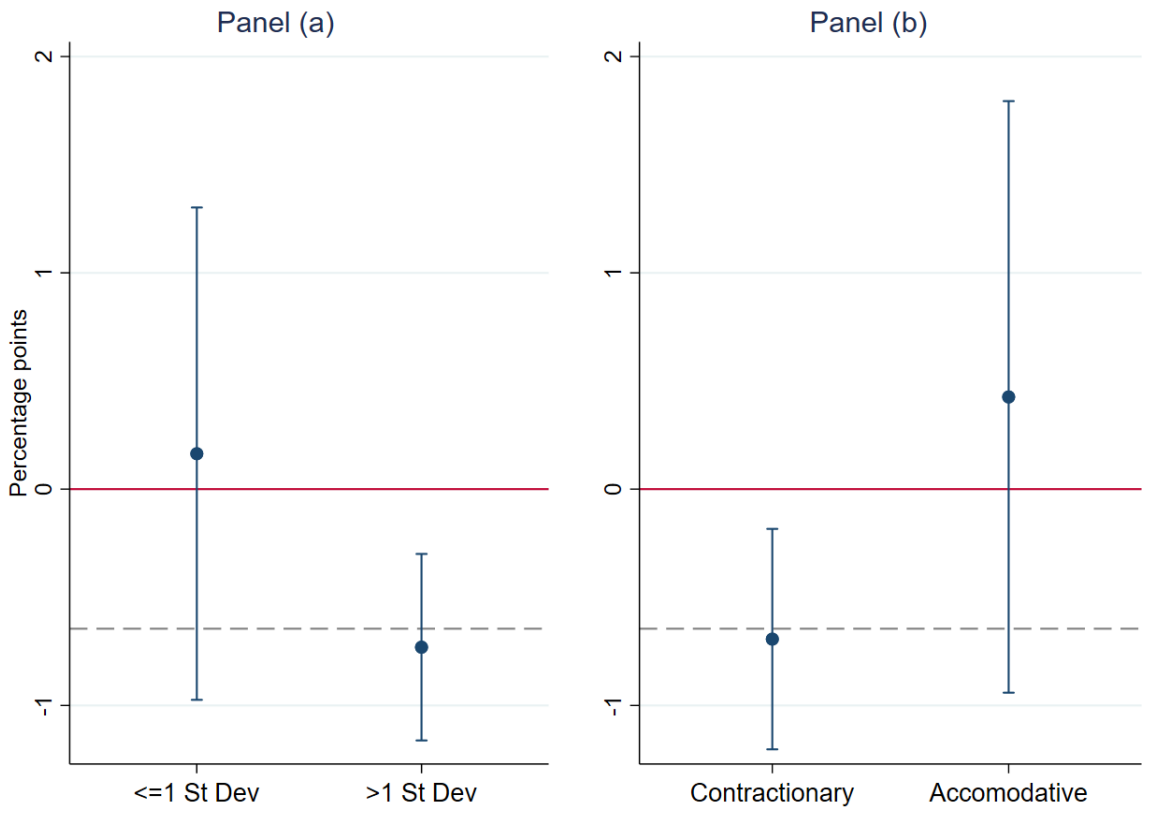
Are firms sophisticated agents?

Dep variable: firm's bank loan expectations			
	(1)	(2)	(3)
ΔDFR	-0.045	-0.108*	
	(0.040)	(0.056)	
MP			-0.864***
			(0.305)
Controls	yes	yes	yes
Country-Wave FE	yes	yes	yes
Sector-Wave FE	yes	yes	yes
Days FE	yes	yes	yes
Observations	37206	6945	30261
Adjusted R^2	0.208	0.249	0.197

Notes: DFR: Deposit Facility Rate. The first column reports the results with all monetary policy shock; the second column when there are announcements with non-zero DFR adjustments and the third one when the ECB did not announce any change the DFR.

- **Firms** demonstrate **a high level of sophistication,** responding primarily to market-based measures of monetary policy rather than to changes in the DFR itself
- **Firms update their expectations even when the ECB announces no change in the DFR.**

MP impact on expectations is non-linear and asymmetric



Notes: Panel (a) compares the impact on firms' bank loan expectations of a contractionary shock smaller/larger than 1 standard deviation (corresponding to 2.3 basis points). Panel (b) compares the impact on firms' bank loan expectations of a contractionary versus accommodative monetary policy shock. Gray dotted horizontal lines represents estimate based on baseline specification with binary dependent variable. Blue vertical lines indicate 90% confidence bounds. Coefficients are multiplied by 100.

- MP affects the expectations if shocks are **large and contractionary**: little attention by firms if the news content is moderate or perceived positive
- Can we distinguish between **asymmetry** and **non-linearity?**
  - Accommodative shock on average smaller

“Pure” MP shocks vs CB information shocks

Following Jarocinski and Karadi (2020):

- **Pure MP shock**: capturing genuine monetary policy shock
- **CB info shock**: capturing the possible impact of news of the current state of the economy revealed by the ECB during its MP announcements

	Dep variable: firm’s bank loan expectations					
	Trichotomous			Binary		
	(1)	(2)	(3)	(4)	(5)	(6)
Pure MP	-1.002***		-0.979***	-0.880***		-0.863***
	(0.256)		(0.257)	(0.273)		(0.275)
CBI		0.673	0.494		0.490	0.324
		(0.505)	(0.506)		(0.514)	(0.516)
Country-Wave FE	yes	yes	yes	yes	yes	yes
Sector-Wave FE	yes	yes	yes	yes	yes	yes
Days	yes	yes	yes	yes	yes	yes
Observations	37206	37206	37206	14831	14831	14831
Adjusted R^2	0.208	0.208	0.208	0.366	0.365	0.366

- **CB information shock** → not significant. Why?
  - Difficult for firms to disentangle the different components of ECB announcement
  - Firms register the information component, but are not able to capture to what extent this new information will affect bank loan availability

Conventional vs unconventional shocks

Following Altavilla et al (2019):

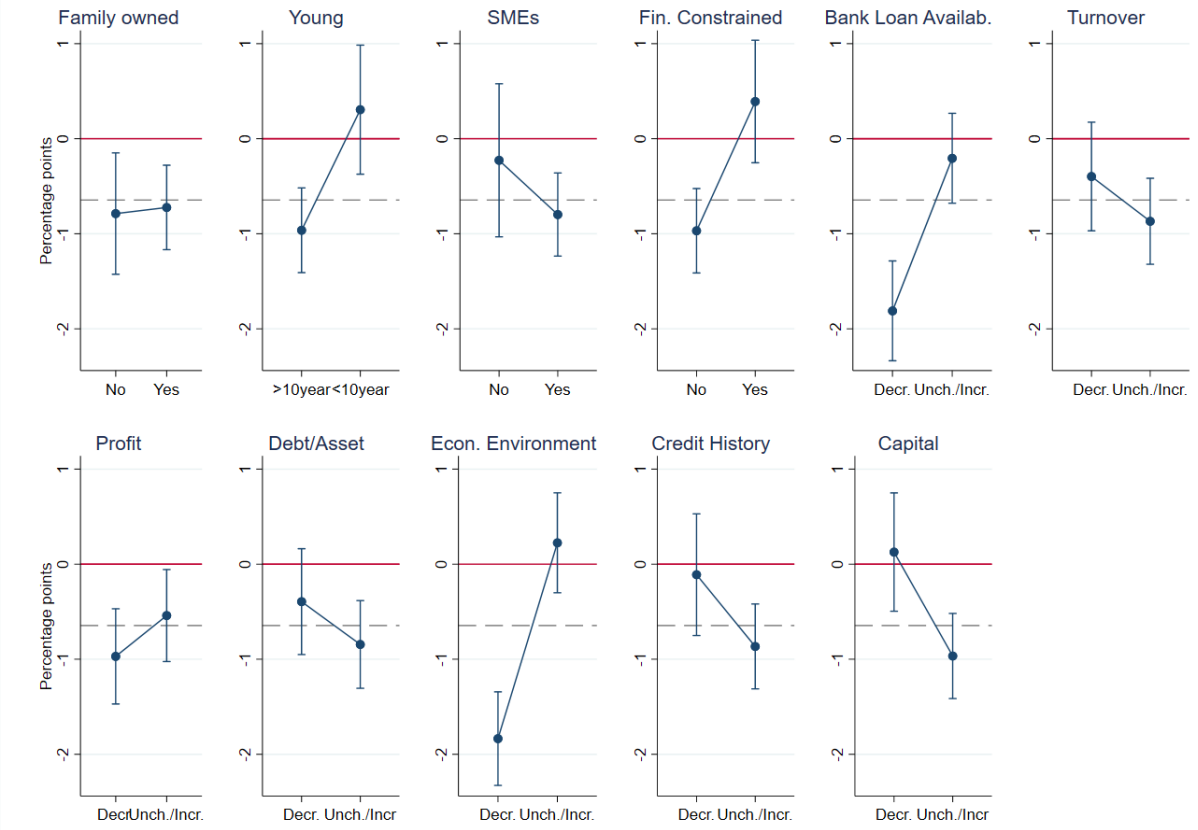
- **Target shock**: unexpected component of a change in the official rates
- **QE shock**: reaction to news regarding the introduction and implementation of APPs

	Dep variable: firm's bank loan expectations			
	(1)	(2)	(3)	(4)
Target	-0.310**			
	(0.144)			
QE		0.582*		
		(0.344)		
Pure QE shock			-0.642	
			(0.837)	
CB information shock, QE				0.894**
				(0.401)
Constant & controls	yes	yes	yes	yes
Country-Wave FE	yes	yes	yes	yes
Sector-Wave FE	yes	yes	yes	yes
Days FE	yes	yes	yes	yes
Observations	37206	23044	23044	23044
Adjusted R^2	0.208	0.227	0.227	0.227

- **Target shock** → coefficient smaller (in absolute term) than baseline
- **QE shock** → weak and positive coefficient.
  - ➢ **Upward revisions of expectations driven by CBI component of QE**

MP impact heterogenous across firms' characteristics

$$Y_{i,t} = \beta_0 + \boldsymbol{\beta_1} D_{i,m} \varepsilon_m * \boldsymbol{x_{i,t}} + \beta_2 X_{i,t} + \alpha_{c,t} + \gamma_{s,t} + \delta_d + u_{i,t}$$



Notes: Gray dotted horizontal lines represents estimate based on baseline specification with binary dependent variable. Blue vertical lines indicate 90% confidence bounds. Coefficients are multiplied by 100.

- While firms' **financial positions** matter to a **limited extend**…
- … **financial constraints, bank loan availability and different perceptions of the economic environment** drive **different response** to MP shocks

Real effects on future investment

Differential in investment between firms expecting increases in bank loan availability versus firms expecting declines

(in percentage points)

	Expected investment	Future investment
	(1)	(2)
ATT	0.086***	0.040***
	(4.64)	(3.18)
Obs	11,433	25,245

Differentials in expected and future investment (ATT) from the propensity score analysis. The propensity score is computed using the nearest neighbour matching with three neighbours. The treatment is increasing future availability of bank loans. Stars denote usual significance intervals, namely, ***p value<0.01), **p value<0.05 and *p value<0.1.

- Indirect strategy based on propensity score analysis to compare firms with similar characteristics, differing only in the direction of their expectations
- **Firms expecting increased or stable bank loan availability report higher levels of investment six month later**

Robustness checks

Several robustness checks related to the choice of sample selection and empirical model for the baseline analysis

- Different windows around the monetary policy shocks
- Different clustering of standard errors
- Re-estimation using ordered probit models (for the trichotomous dependent variable) and probit models (for the binary dependent variable)

All outcomes are in line with the baseline results

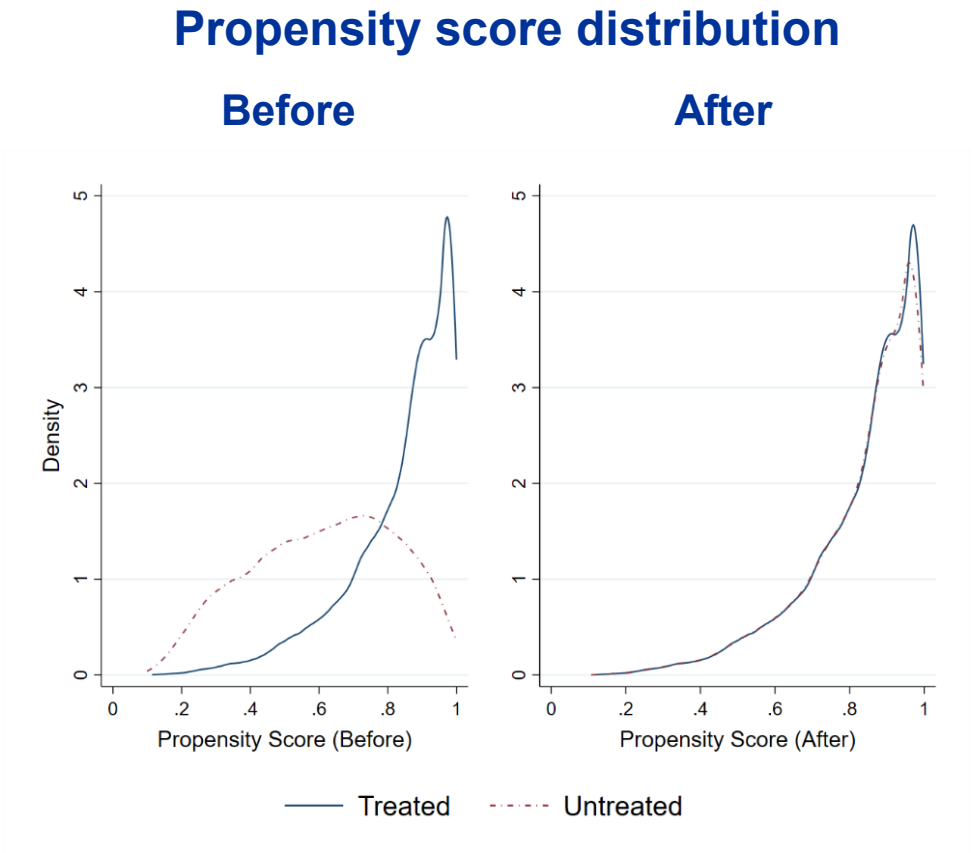
Conclusion

Our results shed new light on the impact of MP on firms' expectations of bank loans

- Monetary policy matters for firms' bank loan expectations
- …but only if expectations are not too high/too low or are decreasing
- Firms update expectations only after large and contractionary shocks
- Firms are able to disentangle the different information content of the shocks (pure vs CBI)
- Firms respond to conventional MP and to the CBI component of QE shocks
- Firms' characteristics matter

Thank you!

Real effects: propensity score analysis



Notes: Distribution of the propensity score before the matching (left graph) and after the matching (right graph). The continuing line represents the distribution of the propensity score of firms in the treated group, i.e., firms that expected bank loan availability to increase in the next 6 months, while the dashed line represents the distribution of the propensity score of firms in the control group, i.e., firms that expected bank loan availability to decrease in the next six months.