Monetary Policy Transmission to Investment: Evidence from a Survey on Enterprise Finance*

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Abstract

We study how survey-based measures of funding needs and availability impact the transmission of euro area monetary policy to investment. We first provide evidence that firms' funding needs are primarily driven by future investment opportunities, while their perceived funding availability is mainly related to financial conditions. Using these two variables, we analyze how the effectiveness of monetary policy depends on fundamentals and financial conditions. Our key findings reveal that monetary policy is most effective when fundamentals are strong. In contrast, firms with good financial conditions exhibit a weaker investment response to monetary policy. Our findings provide new insight into the transmission of monetary policy to investment, highlighting not only the role of financial conditions, but also the importance of structural factors, which are beyond the direct control of central banks.

Keywords: Monetary policy, investment, investment opportunities, financial conditions, survey on enterprise finance
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1 Introduction

Private investment is a key driver of GDP growth. Studies have shown that monetary policy can significantly impact aggregate capital investment, thereby shaping the overall response of an economy to policy changes (Cloyne et al., 2023). Recently, policymakers have expressed concerns about the effectiveness of monetary policy in stimulating investment under certain economic conditions. For example, in the ECB's Monetary Policy Accounts from October 2024, the Governing Council noted that investment remained subdued due to structural factors, such as geopolitical tensions, trade uncertainty, and overregulation.[1] As a result, policymakers concluded that monetary easing alone would be insufficient to trigger a significant rebound in investment. In other words, the impact of monetary policy appeared to be constrained by fundamental issues which are beyond the control of a central bank.

Indeed, in complete frictionless markets, investment should be determined solely by economic fundamentals. According to traditional Q-theory, rational firms base their investment decisions on the marginal product of capital, with Tobin's Q serving as a sufficient statistic for these investment opportunities. However, a vast body of research suggests that financial frictions also play a crucial role, meaning that financial variables will impact investment outcomes, and in turn, affect the transmission of monetary policy (Bernanke and Gertler, 1989; Bernanke et al., 1999). With this in mind, the key question we seek to answer is: How do fundamentals and financial conditions shape the transmission of monetary policy to investment?

The main empirical challenge in addressing this question is disentangling the effects of investment opportunities and financial conditions on investment decisions. Early studies, guided by economic models that often assume rationality and complete information, attempted to separately proxy for these two factors by using accounting data (Fazzari et al., 1988; Gilchrist and Himmelberg, 1998; Love and Zicchino, 2006). However, isolating their effects has proved difficult. For example, the marginal Tobin's Q, which Q-theory suggests as a measure of investment opportunities, is not observable, and commonly used proxies, such as the average Tobin's Q, are confounded by the financial health of the firms. Furthermore, a major constraint is that capital market valuations are not available to SMEs. As a result, even if Tobins' Q was a reliable measure, its application would be restricted to larger firms.

To tackle the challenge of distinguishing between investment opportunities and financial conditions, we directly use firms' assessments from the ECB's Survey on Access to Finance and Enterprise (SAFE). Our goal is to examine investment behavior by analyzing firms' responses to questions regarding their perceived funding needs and the availability of external

[1] See https://www.ecb.europa.eu/press/accounts/2024/html/ecb.mg241114~c0e6f53cf7.en.html

financing. A key advantage of this survey data is its broad coverage, encompassing both large firms and SMEs. Since the survey is completed by business owners, CEOs, or CFOs, they offer direct insight into the decision-making process behind investment choices, also reflecting behavioural biases that might not be accounted for when working solely with accounting variables.

We begin by offering an economic interpretation of funding needs and funding availability, as well as their connection to investment. Specifically, we provide evidence that external funding needs are primarily driven by fundamentals, while funding availability is largely influenced by financial conditions. Intuitively, assuming that a firm has a given level of internal funding, the amount of external funding it seeks will depend mainly on its expectations for future growth — a reflection of economic fundamentals. In contrast, a firm's perception of the availability of external financing will be shaped primarily by current financial conditions. Therefore, by examining the role of funding needs and availability in monetary policy transmission, while controlling for key firm-level variables, we can provide deeper insights into how fundamentals and financial conditions shape the impact of monetary policy on investment.

We first examine the contemporaneous correlation between funding needs and availability and accounting variables. Our findings indicate that funding availability is strongly linked to firm-level financial conditions, particularly leverage — which serves as a proxy for asset-based collateral, and cash flow, which represents earnings-based collateral. We observe a negative correlation between funding availability and leverage, and a positive correlation between funding availability and cash flow, suggesting that firms with higher leverage or lower cash flow perceive external financing as less accessible. In contrast, funding needs exhibit a positive correlation with leverage and a negative correlation with cash flow and liquidity, implying that an increase in cash flow and liquidity is associated with a lower demand for external funding, in line with the substitutability of external and internal funds.

Second, we demonstrate that funding needs and funding availability influence investment in different ways, with varying effects across different types of firms. Our findings indicate that funding needs are a stronger overall predictor of investment, with similar effects for both SMEs and large firms. The difference in the impact of funding needs on investment between these two groups is not statistically significant, suggesting that investment decisions are similarly influenced by funding needs across firms. In contrast, funding availability exhibits significant disparities in its impact on investment. Specifically, availability plays a crucial role in determining future investment for smaller firms, as well as for firms with high leverage or greater debt burdens — characteristics commonly associated with financial constraints. This shows that investment decisions for financially constrained firms are driven significantly more by the perception of the availability of external funding.

Our third piece of evidence supporting our hypothesis about the distinct roles of funding needs and availability is based on a quasi-natural experiment. We examine bank branch changes in subregions in Portugal, drawing on established research that shows that the number of bank branches significantly impact credit lending (Morgan et al., 2016; Nguyen, 2019). More recently, Bonfim et al. (2021) argued that bank branch closures in Portugal were driven by restructuring efforts unrelated to profitability in certain subregions. Leveraging this insight, we assess the effect of the number of bank branches on the average funding needs and availability as reported by the Portuguese firms in our sample. Our findings indicate that an increase in bank branches in a specific subregion significantly enhances the perceived availability of external funding, while funding needs remain unchanged. This supports our hypothesis that shocks to financial conditions primarily influence firms' perceptions of external funding availability, without affecting their fundamental demand for external financing.

Our main empirical contribution aims to understand the transmission of monetary policy with respect to fundamentals and financial conditions. To analyze the effects of monetary policy, we adopt the high-frequency identification approach widely used in the literature, measuring policy surprises through changes in OIS rates within a 30-minute window around ECB Governing Council announcements. We use the monetary policy surprises constructed by Altavilla et al. (2019) from changes in OIS rates up to ten years around the ECB's press conference. We focus on the forward guidance factor because it has a higher impact on longer-maturity yields which are more relevant for firms' long-term borrowing. Additionally, a significant portion of our sample falls within the zero lower bound (ZLB) period, during which the target rate exhibited minimal movement.

Using the funding needs and funding availability, we estimate the impact of monetary policy surprises on investment through local projections. Specifically, we regress future firm-level investment on the monetary policy surprises interacted with funding needs and funding availability, which serve as proxies for fundamentals and financial conditions, while controlling for other firm-level accounting variables. Our results confirm that fundamentals and structural factors driving investment opportunities play a crucial role in the transmission of monetary policy. For example, we find that a 1 basis point increase in forward guidance surprise leads to a 15 basis points greater reduction in investment for a firm that reported increased external funding needs, compared to a firm whose funding needs remained unchanged over the past six months. This finding suggests that monetary policy effectiveness is significantly weaker when investment is constrained by structural factors, reinforcing the idea that easing monetary policy alone may not be sufficient to stimulate investment under such conditions.

Likewise, our analysis of the effects of monetary policy on investment through the avail-

ability of funding suggests that tighter financial conditions amplify the impact of monetary policy on investment. In other words, firms experiencing greater financial constraints respond stronger to monetary policy surprises, a finding consistent with empirical studies such as Oliner and Rudebusch (1996), Durante et al. (2022), and Cloyne et al. (2023), and theoretical models like Kiyotaki and Moore (1997) and Bernanke et al. (1999). We find that the difference in investment response to monetary policy can be as large as 10 basis points between firms that experienced an increase in funding availability and those whose availability remained unchanged over the previous six months.

Our main results on the monetary policy transmission can be interpreted through the lens of the credit channel. Monetary easing is expected to improve the financial conditions of firms by easing borrowing restrictions via the balance sheet channel and facilitating lending through the bank lending channel (Bernanke and Gertler, 1995). On the one hand, if structural weaknesses — such as overregulation and economic uncertainty — keep credit demand low, these channels, which mainly operate through credit supply, will do little to stimulate investment. In such cases, the ability of central banks to boost investment and economic growth through monetary policy remains highly limited. On the other hand, if financial conditions are excessively tight, then, all else equal, easing them would lead to increased investment, particularly for financially constrained firms, such as small enterprises and highly leveraged firms.

This paper contributes to the literature on monetary policy transmission channels to investment using firm-level data. This line of research dates back to Gertler and Gilchrist (1994), who showed that the sales and inventories of small firms are more sensitive to monetary policy. More recently, Cloyne et al. (2023) found that the investment of financially constrained firms — defined as young firms that do not pay dividends — reacts more strongly to monetary policy. Similarly, Jeenas (2024) documented that monetary policy shocks lead to larger fluctuations in fixed capital formation, inventories, and sales growth for firms with high leverage and low liquid assets. Additionally, Ottonello and Winberry (2020) showed that firms with low default risk and low leverage are more responsive to monetary policy, a finding that appears to contrast with the research emphasizing the stronger reactions of financially constrained firms. Our findings align with Durante et al. (2022), who report significant cross-sectional effects of monetary policy on firm investment in the euro area. Beyond confirming the role of financial frictions in monetary policy transmission, our contribution extends the literature by using alternative measures of financial conditions and by providing novel evidence on the transmission of monetary policy conditioned on structural factors.

Our study is also related to the literature on investment determinants, which dates back

to the neoclassical theory of investment, where firms' decisions are based solely on profit maximization, without considering financial factors (Hall and Jorgenson, 1967). However, empirical studies have challenged this view, showing that financial factors significantly influence investment. For instance, Fazzari et al. (1988) show that cash flow sensitivity is a strong predictor of investment, suggesting that financial conditions matter. However, Kaplan and Zingales (1997) argue that cash flow sensitivity alone cannot be taken as definitive evidence of financial constraints affecting investment. Gilchrist and Himmelberg (1998) address this issue by using a VAR model to estimate a "Fundamental Q", showing that investment remains sensitive to cash flow, even when controlling for future investment opportunities. To disentangle the effects of fundamentals and financial conditions, we use survey-based measures of funding needs and availability. Our results confirm that both factors influence investment, although fundamentals play a significantly larger role. Similarly, Love and Zicchino (2006) use a VAR approach to examine the effects of fundamentals and financial conditions on investment across countries. They find that financial factors affect investment more in countries with less developed financial systems. Consistent with this, we find that financial conditions are more important for the investment of firms that are financially constrained, measured by size, leverage, and debt burden.

The remainder of the paper is structured as follows: Section 2 introduces the dataset and presents descriptive statistics. Section 3 examines the relationship between our key variables — funding needs, funding availability, and investment. Section 4 presents our main empirical findings on monetary policy transmission, highlighting the distinct roles of funding needs and availability. Section 5 concludes the paper.

2 Data and summary statistics

In this section, we outline the data sources used in our analysis. Our primary dataset, SAFE-ORBIS, is proprietary and created by integrating firms from the Survey on the Access to Finance of Enterprises (SAFE) — conducted jointly by the European Central Bank and European Commission — with the ORBIS database supplied by Bureau van Dijk (BvD), a Moody's Analytics subsidiary. The SAFE is a comprehensive European firm-level survey covering more than 11,000 firms. Launched in 2009, the survey was initially conducted bi-annually and has shifted to a quarterly schedule starting in 2024.[2] Our paper examines all survey rounds from 2010 to 2022.[3] The survey targets a representative sample of

[2]For further details, see https://www.ecb.europa.eu/stats/ecb_surveys/safe/html/index.en.html.

[3]Specifically, we analyze survey rounds 3 to 27, covering the period from Q2-Q3 2010 to Q4 2022-Q1 2023.

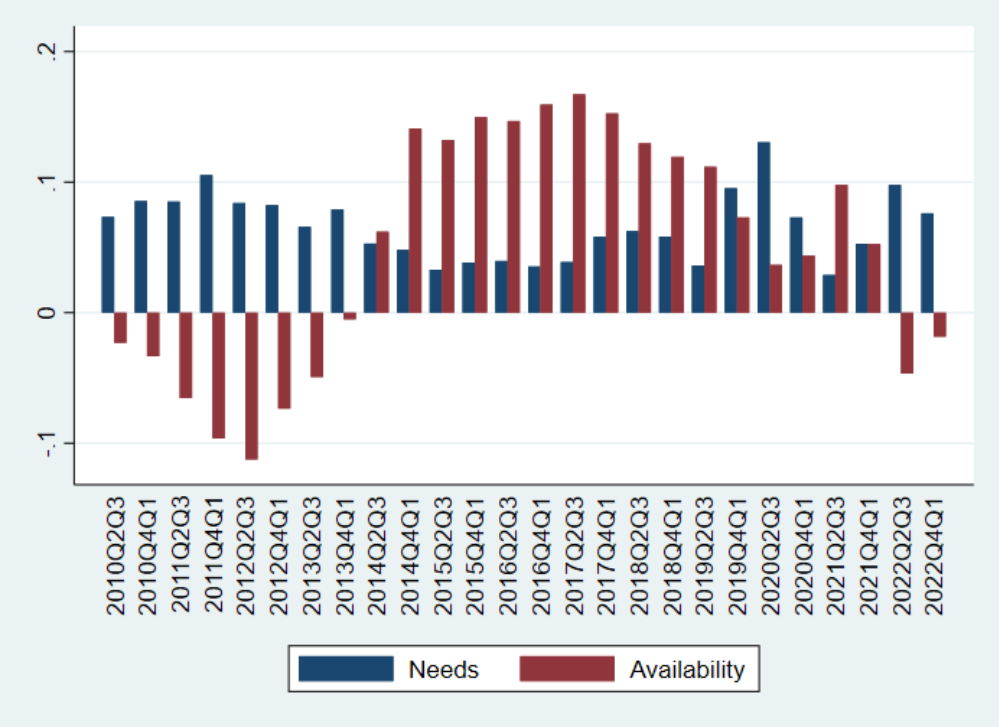
non-financial firms across the 20 euro area countries, spanning the four primary sectors: manufacturing, construction, trade, and services. It collects detailed firm-level information, including size, ownership, age, sector, and financial position, while also assessing recent changes in firms' access to finance and their perceptions of the broader economic environment.

Our analysis focuses on survey questions related to firms' external financing needs and their perceived availability of various financing sources: bank loans, credit lines, trade credit, equity, and debt security issuance. Specifically, each firms is asked the following question: *"For each of the following types of external financing — bank loans, credit lines, trade credit, equity, and debt security issuance — please indicate whether your needs (availability) increased, remained unchanged, or decreased during the previous and current quarter"*. The responses to these questions are used to create a discrete variable for each type of financing, assigned a value of 1 if the firm reports an increase, -1 for a decrease, and 0 if unchanged. The firm-level average of these values in a given period t generates two key indicators: Needs_t and Avail_t. A positive value for Needs_t or Avail_t indicates that the firm reported an increase in external financing needs or availability for the majority of instruments or for at least one instrument while for the other reported no changes[4]

Figure 1 presents the average values of Needs_t and Avail_t by survey round. Needs_t is predominantly positive, peaking before the euro area recession triggered by the sovereign debt crisis in 2011 and again in early 2020, just before the COVID-19 outbreak. Between 2010 and early 2014, Avail_t remained mostly negative, primarily due to declining bank loan availability following the sovereign debt crisis. However, from 2014 onward, availability improved, turning positive and peaking in the years leading up to COVID-19, coinciding with the ECB's expansion of its monetary policy toolkit to ease financing conditions and strengthen policy transmission. Toward the end of our sample period, Avail_t declined into negative territory, reflecting tightening lending conditions even before the ECB's first policy rate hike in July 2022.

[4]As an example, a firm that reports increasing need for bank loans while unchanged for all other instruments (credit lines, trade credit, equity and debt security issuance) will have $\text{Needs}_t = \frac{1+0+0+0+0}{5} = 0.2$. The same value can occur when needs for bank loans, credit lines and trade credit are increasing while for equity and debt security issuance are decreasing.

Figure 1: Firms' needs and availability for external finance over time



Note. The figure shows the weighted average of the two indicators Needs_t and Avail_t for each survey round for the complete sample of the survey. The weights, included in the SAFE dataset, restore the proportions of the economic importance of each size class, economic activity and country. For a detailed description of the variables see A.1. Source: authors elaboration on ECB SAFE data.

To complement our analysis, we use the ORBIS dataset, which provides annual balance sheet and profit and loss account information for firms. From this dataset, we construct a variety of firm-level financial variables. Our dependent variable, the investment rate, is measured as the annual growth rate of fixed capital. Additionally, we include key financial indicators such as financial leverage, debt burden ratio , liquidity ratio, return on equity (ROE), internal funding, sales growth, and firm size. We also create two measures of firm size: an SME dummy based on the number of employees and continuous variable based on total assets.[5] To ensure data quality, we follow Kalemli-Özcan et al. (2022) and exclude firms reporting negative total assets, sales, or age (measured as years since incorporation). We also drop observations where fixed assets are negative or missing. Finally, we winsorize each variable by country, year and sector, thereby reducing the influence of extreme outliers. For all our variables of interest the kurtosis remains below 10.

To match the semi-annual SAFE data with the annual ORBIS data, we align each SAFE

[5]Table A.1 provides a detailed overview of the variable definitions.

observationwith the most recent ORBIS observation that precedes the SAFE reference period[6]. Our final sample consists of 23,417 firms and 61,322 observations. Table 1 presents the descriptive statistics of the variables used in our analysis.

Table 1: Summary Statistics

Variable	Mean	SD	p25	p50	p75	Min	Max	N
Needs_t	0.09	0.49	0.00	0.00	0.33	-1.00	1.00	61322
Avail_t	0.12	0.48	0.00	0.00	0.33	-1.00	1.00	61322
Investment_{t+1}	0.05	0.28	-0.07	-0.00	0.11	-0.93	1.23	61322
Leverage_t	0.21	0.21	0.02	0.16	0.33	0.00	1.38	61322
ROE_t	0.09	0.39	0.01	0.08	0.18	-1.61	1.69	61322
Internal fund_t	0.17	0.17	0.07	0.14	0.23	-0.34	1.09	61322
Liquidity_t	1.47	1.44	0.68	1.07	1.64	0.03	8.09	61322
Sales growth_t	0.06	0.29	-0.06	0.03	0.12	-0.84	1.73	61322
SME	0.57	0.49	0.00	1.00	1.00	0.00	1.00	61322
Size_t	16.04	2.39	14.18	16.20	17.81	6.78	24.63	61322
Debt burden_t	0.17	0.17	0.03	0.11	0.29	0.00	0.61	51068

Note. The table shows the descriptive statistics of the variables used in the analysis. The statistics are weighted according to the SAFE weights that restore the proportions of the economic importance of each size class, economic activity and country. For a detailed description of the variables see A.1. Source: authors elaboration on SAFE-ORBIS dataset.

Our analysis of monetary policy effects builds on the monetary economics literature that identifies causal effects of monetary policy using high-frequency movements in interest rates around central bank announcements (Kuttner, 2001; Gurkaynak et al., 2005). The key assumption is that within a sufficiently short window, typically 30 minutes, these interest rate movements are driven solely by central bank announcements, provided no other major events occur within the window. We obtain monetary policy surprises from the Euro Area Monetary Policy Event-Study Database (EA-MPD), compiled by Altavilla et al. (2019). They extract monetary policy surprises from changes in OIS rates at 1, 3, and 6-month maturities, as well as 1, 2, 5, and 10-year maturities, measured around the ECB press release and press conference window.[7] For our analysis, we focus on the forward guidance surprise,

[6]For our main dependent variable, future investment, the match differs depending on the reference period of the SAFE rounds. in the survey rounds covering the second and third quarter of the year, we assign to each firm the average investment rate over the two years following the SAFE reference period. In the survey rounds covering the the fourth quarter of the year Y and the first quarter of the year $Y+1$, we assign the investment rate of the year $Y+1$. This approach prevents the same investment rate from being matched to survey responses from multiple periods.

[7]Altavilla et al. (2019) follow the methodology of Gurkaynak et al. (2005) and Swanson (2021) to identify three latent factors from the OIS rates over their full sample. To provide an economic interpretation, they impose restrictions on how these factors influence the OIS rates using a rotation matrix, which results in

which is derived from the press conference window and has been shown to have the strongest effects on yields with maturities between 1 and 5 years which are those more relevant for firms' long-term borrowing. To align these high-frequency monetary policy surprises with our lower-frequency firm-level data, we follow Bauer and Swanson (2023) and aggregate the surprises by summing them over each six-month SAFE reference period. Figure A.1 in the appendix illustrates the aggregated monetary policy surprises, while Figure A.2 presents the original series.

3 An economic interpretation of funding needs and availability

3.1 Factors related to needs, availability and investment

In this section, we evaluate how the survey-based data on corporate demand for external finance (Needs_t) and credit supply (Avail_t) are related to firms' performance and investment. Specifically, we focus on the selected set of variables presented in the previous section.

Leverage and the debt burden ratio are used to assess balance sheet vulnerabilities, serving as proxies for specific financial frictions related to credit risk (see Ottonello and Winberry (2020) for a detailed discussion of leverage). The liquidity ratio indicates a firm's ability to meet its current debt obligations without relying on external capital and it can also serve as internal funding. Similarly, ROE and our internal funding indicator can reflect a firm's broader capacity to finance its business projects independently. Additionally, we consider past sales growth as an indicator of the firm's potential for expansion. Under information asymmetry, ROE, sales growth, and internal funding measures can also act as signals of financial health to lenders, influencing their assessment of a firm's creditworthiness. Finally, we consider firm's size based on the number of employees and total assets, following Gertler and Gilchrist (1994) who show that smaller firms face greater financial constraint.

Table 2 displays the pairwise conditional correlations of all variables used in the econometric analysis with our survey-based funding needs and availability.[8] The correlations are conditioned on sector and country fixed effects. Both, funding needs and availability, are positively correlated with future investment, and negatively correlated with each other. This suggests that these two survey-based variables capture distinct types of information that correlate positively with investment. The interpretation of needs and availability becomes clearer, when compared with other financial ratios. Specifically, firms' reported needs for

three distinct policy surprises: the target factor, the forward guidance factor, and the QE factor.

[8] See Table A.1 in the appendix for the unconditional correlations.

external finance are negatively correlated with profitability, liquidity, and our internal funding indicator — an indication that, when internal funds are abundant, firms tend to turn less at external funds, in line with the Pecking Order Theory. In contrast, funding needs are positively correlated with leverage. This is plausible in the sense that higher external funding needs should increase leverage. The correlation between reported funding availability and financial ratios indicates that firms perceive greater access to external financing when their performance improves and their financial position strengthens. This is reflected in the positive correlation with ROE and sales growth, as well as the negative correlation with leverage and debt burden, suggesting that firms with stronger financial health report higher funding availability.

This initial piece of evidence highlights that firms' responses to funding needs and funding availability capture distinct information sets, each correlating differently with firms' accounting variables. While these are only conditional contemporaneous correlations, the findings naturally suggest that availability reflects financial conditions, whereas needs are rather tied to investment opportunities. In the following sections, we enhance our empirical analysis by introducing a more structured approach that extends beyond correlations.

Table 2: Correlation of needs and availability with accounting variables

	Needs_t	Avail_t
Needs_t		-0.04^{***}
Avail_t	-0.04^{***}	
Leverage_t	0.15^{***}	-0.07^{***}
Investment_{t+1}	0.08^{***}	0.08^{***}
ROE_t	-0.02^{***}	0.06^{***}
Internal fund_t	-0.15^{***}	0.12^{***}
Liquidity_t	-0.02^{***}	0.00
Sales growth_t	0.03^{**}	0.10^{***}
SME-dummy	-0.03^{**}	-0.06^{***}
Size_t	0.01^{***}	0.02^{***}
Debt burden_t	0.22^{***}	-0.38^{***}

Note. The table shows the pairwise correlations between Needs_t and Avail_t with the variables used in the analysis. Correlations are weighted (see notes to Table 1) and conditional to sector and country times wave fixed effects. Significance is calculated using standard errors clustered at firm and wave level,*p<0.10**p<0.05***p<0.01. For a detailed description of variables see Table A.1. Source: authors elaboration on SAFE-ORBIS dataset.

3.2 Effects of needs and availability on investment

In this section, we examine how information from the survey affects firms' investment decisions. We begin with a straightforward investment equation that incorporates the set of financial ratios introduced in the previous section, $X_{i,t}$, supplemented by funding needs and availability:

$$\text{Inv}_{i,t+1} = \beta_1 \text{Needs}_{i,t} + \beta_2 \text{Avail}_{i,t} + \gamma X_{i,t} + \text{Inv}_{i,t} + \alpha_{i,s,t} + \epsilon_{i,t} \tag{1}$$

Depending on the specification, the set of fixed effects, $\alpha_{i,s,t}$, used to control for potential omitted variable biases are: time and sector, country-by-time fixed effects, and firm fixed effects. However, the use of firm fixed effects significantly reduces the number of observations, as relatively few firms participate in the survey across multiple years. We cluster standard errors at firm and time levels.

Table 3 presents the estimated coefficients from the investment function. Focusing first on the financial ratios, we find that the signs and significance levels of the coefficients remain consistent regardless of whether time and sector fixed effects are included in the specification. Future investment increases for firms that have previously invested and experienced high sales growth. Conversely, the availability of internal funds and leverage reduces investment. In the last column, we include firm fixed effects to remove firm-specific unobserved effects, such as firms' average investment. In this case, it turns out that firms that have already invested tend to invest less in the subsequent period, in line with the literature that shows that investment is lumpy and firms' do not invest in subsequent periods (DeAngelo et al., 2011; Im et al., 2020).

Our primary interest is to assess the additional role of funding needs and funding availability as predictors of investment. In Table 3, both variables exhibit a similar positive impact on investment, even after controlling for firm-level financial variables. This finding suggests that our survey-based measures capture valuable information beyond traditional accounting variables, highlighting their importance in explaining future investment decisions.

To assess the economic relevance of the two variables, we consider how much is the increase in future investment for firms that move from the 25th percentile (no changes in needs/availability) to the 75th percentile of the distribution of Needs_t, respectively of Avail_t (equivalent to a reported moderate increase of needs and availability, equal to 0.3, when the maximum is 1). Focusing on the second column, the increase in future investment would be by 1 percent and 0.8 percent, respectively. In alternative, we can also think in terms of standard deviations. Our estimates imply that a one standard deviation increase in needs and availability (which is similar for both variables at around 0.48) implies an increase in

future investment by 1.6 percent and 1.2 percent, respectively.

Table 3: Effects of funding needs and availability on future investments

	(1) Inv_{t+1}	(2) Inv_{t+1}	(3) Inv_{t+1}
$Needs_t$	0.03^{***}	0.03^{***}	0.02^{***}
	(0.01)	(0.00)	(0.00)
$Avail_t$	0.03^{***}	0.03^{***}	0.02^{***}
	(0.00)	(0.00)	(0.01)
$Investment_t$	0.06^{***}	0.06^{***}	-0.13^{***}
	(0.01)	(0.01)	(0.01)
$Leverage_t$	-0.05^{***}	-0.05^{***}	-0.25^{***}
	(0.01)	(0.01)	(0.03)
ROE_t	0.05^{***}	0.05^{***}	0.03^{***}
	(0.01)	(0.01)	(0.01)
Internal $Fund_t$	-0.02^{*}	-0.02	0.08^{**}
	(0.01)	(0.01)	(0.04)
$Liquidity_t$	0.01^{***}	0.01^{***}	0.02^{***}
	(0.00)	(0.00)	(0.00)
Sales $growth_t$	0.05^{***}	0.06^{***}	0.01
	(0.01)	(0.01)	(0.01)
SME-dummy	-0.01^{**}	-0.01^{**}	-0.00
	(0.00)	(0.01)	(0.01)
Observations	61322	61322	51068
R-squared	0.02	0.03	0.48
Firm FE	N	N	Y
Time FE	N	N	Y
Sector FE	N	Y	N
Country × FE	N	Y	N

Note. The table reports estimated coefficients of the equation 1. All regressions are weighted using the SAFE weights (see notes to Table 1). Standard errors clustered at firm and wave level, *p<0.10**p<0.05***p<0.01. For a detailed description of variables see Table A.1. Source: authors elaboration on SAFE-ORBIS dataset.

To disentangle potential differences in the channels through which funding needs and availability affect investment, we adopt an alternative specification that exploits firm-level

heterogeneity. In Table 4, we interact Needs_t and Avail_t with firm characteristics commonly used as proxies for financial constraints. The first two columns examine size-based constraints, following Gertler and Gilchrist (1994) and Perez-Quiros and Timmermann (2000). Column 1 includes an SME dummy, which equals one if the firm has fewer than 250 employees. Column 2 uses an alternative size dummy, that equals one if the firm's log total assets are below the 75th percentile. The third and fourth columns focus on debt-based financial constraints, in line with the financial accelerator literature. Column 3 defines a high-leverage dummy, which equals one if the firm's leverage ratio is above the 75th percentile (equivalent to 32% leverage). Column 4 introduces a high debt burden dummy, which equals one if the debt burden ratio exceeds 27% (the 75th percentile).

Examining the interaction terms, we find no statistically significant differences in the impact of Needs on investment across firm types. This suggests that past external funding needs drive investment similarly for small and large firms, as well as for firms with high and low leverage. However, funding availability exhibits a stronger effect on investment for financially constrained firms, with all estimated availability interaction coefficients being positive and mostly statistically significant. This finding implies that investment in small firms and those with high leverage or debt burden is more sensitive to changes in funding availability. Our results align with Love and Zicchino (2006), who finds that financial factors play a larger role in investment decisions in countries with less developed financial systems.

Our results also suggest that large firms and firms with low leverage, which typically have strong economic and financial performance, are less dependent on the availability of external funding. Instead, their investment decisions are primarily driven by investment opportunities, reinforcing the idea that financially stable firms can fund their investment opportunities regardless of credit market conditions.

Table 4: Link of financial constraint and the effects of needs and availability on investment

	Size-based financial constraints		Debt-based financial constraints	
	Inv_{t+1} FC=SME	Inv_{t+1} FC=LowLogTA	Inv_{t+1} FC=High_Lev	Inv_{t+1} FC=High_DebtBurd
$Needs_t$	0.04^{***}	0.04^{***}	0.03^{***}	0.04^{***}
	(0.01)	(0.01)	(0.01)	(0.01)
$Avail_t$	0.02^{*}	0.02^{***}	0.02^{***}	0.02^{***}
	(0.01)	(0.01)	(0.00)	(0.01)
FC	-0.01^{***}	0.01	-0.02^{***}	-0.03^{***}
	(0.01)	(0.01)	(0.01)	(0.01)
FC×$Needs_t$	−0.01	−0.00	0.01	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)
FC×$Avail_t$	0.01	0.01^{**}	0.01^{*}	0.01^{*}
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	61322	61322	61322	57448
R-squared	0.03	0.03	0.03	0.04
Sector FE	Y	Y	Y	Y
Country × FE	Y	Y	Y	Y

Note. The table reports the estimated coefficients of a model built on equation 1 by adding interactions with the variables signaling financially constrained firms. All regressions are weighted using the SAFE weights (see notes to Table1). Standard errors clustered at firm and wave level, *p<0.10**p<0.05***p<0.01. Source: authors elaboration on SAFE-ORBIS dataset.

3.3 A quasi-natural experiment: Portuguese bank branches

In this section, we aim to further support our assumption that reported funding availability is primarily linked to financial conditions, while reported funding needs are mainly associated with investment opportunities. We use a quasi-natural experiment that we draw from the literature on bank branch closures and their effects on credit lending. Specifically, we build on the insights of Bonfim et al. (2021), who argue that the decline in the number of bank branches in Portugal after the financial crisis was not driven by profitability considerations but was instead "forced upon" banks. Especially between 2012 and 2018, the density of the branches in Portugal decreased significantly in different regions, in part due to restructuring agreements with the European Commission. This exogenous variation in bank branches provides a natural setting to examine how changes in credit supply conditions influence firms'

perceived funding availability while leaving investment opportunities largely unaffected.

To evaluate the impact of bank branch closures on funding needs and availability, we collect data on the annual number of local bank branches at the NUTS3 subregion level in Portugal from the Portuguese Banking Association (APB).[9] We merge this data with our SAFE-ORBIS dataset by averaging the funding needs and availability of Portuguese firms within each subregion. We then examine how changes in the number of bank branches affect funding needs and availability. While the variation in bank branch density argubly provides exogenous source of changes in current financial conditions, it could still be influenced by variables correlated with past investment opportunities in specific regions. To address potential endogeneity concerns, we control for lagged funding needs and availability, along with our control variables. We also include subregional and time-fixed effects to account for unobserved regional and time-specific factors.

Table 5 presents our main findings. Columns 1 to 3 examine the relationship between the number of bank branches and funding needs. Column 1 estimates a contemporaneous regression, Column 2 uses lagged bank branches, and Column 3 runs the regression in first differences. The results show that the number of bank branches in Portugal is largely unrelated to firms' funding needs, suggesting that changes in financial conditions do not influence firms' demand for external financing. Columns 4 to 6 repeat the analysis with funding availability as the dependent variable. In contrast to the results for funding needs, the coefficients here are positive and statistically significant, indicating that changes in financial conditions do affect firms' perceived access to external funding. Specifically, a higher number of bank branches is associated with greater reported funding availability. These findings reinforce the idea that financial conditions primarily shape firms' perceptions of funding availability, while actual demand for external financing remains unchanged in response to such changes.

Overall, our findings indicate that both funding needs and funding availability are important drivers of future investment, even after controlling for accounting variables. Moreover, these variables capture fundamentally different information, allowing us to better distinguish between the roles of investment opportunities and financial conditions in shaping firms' investment decisions.

[9]The data is publicly available at apb.pt/pt/publicacoes/estatisticas.

Table 5: Impact of bank branches on needs and availability

	Needs_t	Needs_t	Needs_t	Avail_t	Avail_t	Avail_t
Nr. Bank branches	-0.02	-0.01	-0.09	0.08^{**}	0.08^{*}	0.07^{**}
	(0.03)	(0.05)	(0.09)	(0.04)	(0.05)	(0.04)
Investment_{t-1}	-0.85	-0.03	0.03	1.26	-1.57	-0.72
	(1.96)	(2.92)	(2.27)	(2.13)	(2.76)	(2.82)
Leverage_{t-1}	1.51	0.82	-1.85	3.27	2.18	17.63
	(1.78)	(1.75)	(14.11)	(2.21)	(1.46)	(11.92)
$\text{Sales growth}_{t-1}$	-1.61^{*}	-2.65	-0.64	2.10	3.42	3.97
	(0.83)	(1.62)	(1.90)	(2.43)	(3.23)	(2.82)
ROE_{t-1}	1.14	1.17	-2.69	-1.43	-0.39	1.63
	(0.90)	(1.21)	(3.00)	(1.72)	(1.62)	(2.47)
$\text{Internal funding}_{t-1}$	3.43	3.04	15.83^{*}	-2.35	0.11	-5.95
	(3.26)	(5.95)	(8.75)	(5.22)	(7.47)	(5.43)
SME_{t-1}	-0.07	0.02	0.48^{**}	0.31^{***}	0.24	-0.45^{**}
	(0.10)	(0.14)	(0.19)	(0.10)	(0.16)	(0.18)
Liquidity_{t-1}	-0.72	-0.88	0.65	0.97^{**}	0.86^{*}	-0.16
	(0.47)	(0.58)	(0.60)	(0.48)	(0.47)	(0.61)
Needs_{t-1}	0.28^{***}	0.27^{***}	-0.51^{***}	0.06	0.09	0.22
	(0.09)	(0.10)	(0.11)	(0.08)	(0.09)	(0.20)
$\text{Availability}_{t-1}$	0.14^{***}	0.13^{**}	-0.19	0.28^{***}	0.27^{***}	-0.07
	(0.05)	(0.06)	(0.29)	(0.07)	(0.07)	(0.15)
Observations	132	121	121	132	121	121
R^2	0.49	0.47	0.63	0.81	0.79	0.48

The table presents the estimated coefficients from a linear regression of needs and availability on bank branches and further controls. Columns 1 and 4 use the contemporaneous number of bank branches, Columns 2 and 5 use the lagged number of bank branches, and Columns 3 and 6 estimate the regression in first differences. Two-way clustered standard errors are reported in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

4 Monetary policy transmission

4.1 Unconditional monetary policy transmission

In this section, we examine how the response of firms' investment to monetary policy depends on their needs and availability of external funding. Addressing this question will help clarify the distinct roles that structural factors and financial conditions play in the transmission of monetary policy. We begin by analyzing the average effect of monetary policy on firm-level investment, which provides a benchmark for assessing the contribution of our cross-sectional results in a subsequent analysis.

To estimate the impulse response functions (IRFs) of monetary policy on investment, we use local projections, following Jordà (2005). Specifically, we regress future firm-level investment on monetary policy surprises while controlling for firm-level accounting variables and macroeconomic conditions. In addition, we incorporate sector- and country-fixed effects to account for possible industry-specific and regional unobserved effects:

$$I_{i,t+h} = \alpha_h + \beta_h \cdot mps_t + \theta_h I_{i,t-1} + \Gamma_h X_{i,t-1} + \gamma_c + \delta_s + \varepsilon_{i,t+h} \tag{2}$$

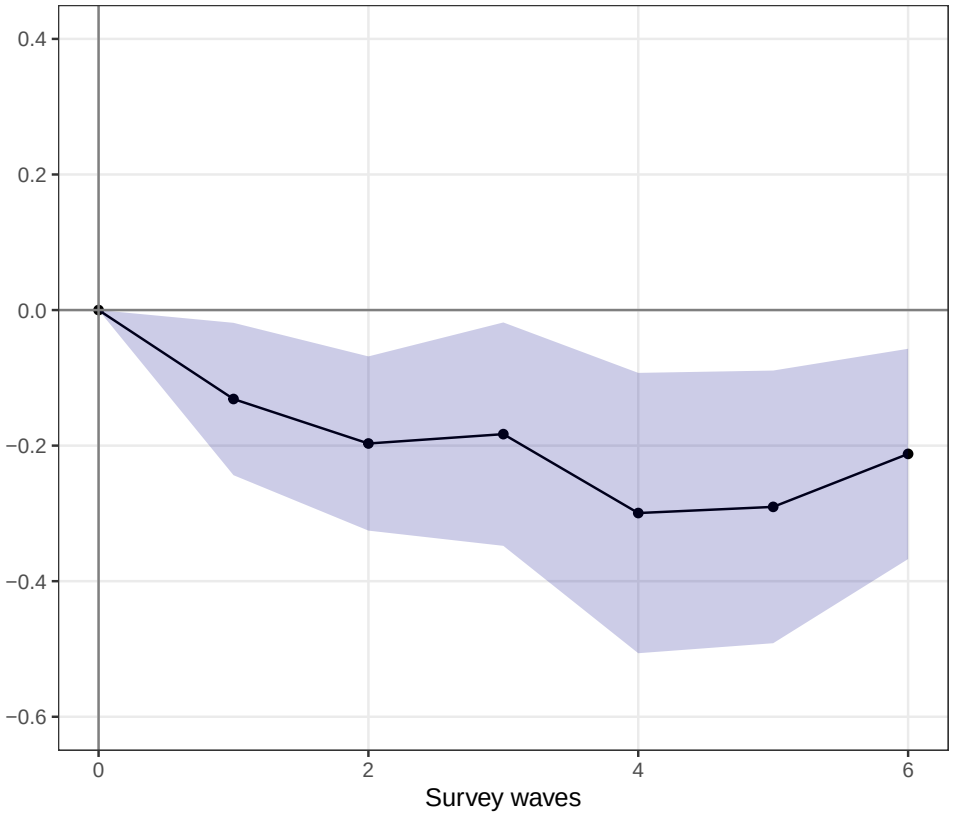
where $I_{i,t+h}$ represents the investment rate of firm i at horizon h, mps_t the monetary policy surprises at time t, $X_{i,t-1}$ firm-level controls measured before the monetary policy surprises, γ_c and δ_s are country and sector fixed effects.[10] $X_{i,t-1}$ contains the variables used in the analysis of Table 3 and lagged values of funding needs and availability. Due to the rotating participation of firms in the SAFE survey, relatively few firms remain in the sample in several consecutive survey rounds. As a result, including lagged survey variables leads to a substantial loss of observations in our regressions. To mitigate this issue, we impute missing lagged values of needs and availability by replacing them with the average for firms within the same time period, sector, country, and size category. Due to data limitations, we restrict our analysis to a maximum horizon of six survey rounds — equivalent to three years. In our judgment, this window is sufficient to capture potential lagged effects of monetary policy on real investment, while avoiding a substantial reduction in sample size.

Figure 2 presents the results of our local projection analysis. We find that a 1 basis point increase in monetary policy surprises leads to an average decline in investment of 0.2 percentage points after one year and 0.25 after two years. The effect is statistically significant and persists for several periods. Our findings closely align with Durante et al. (2022), who report that a monetary policy surprise reduces investment by 0.3 percentage points after one

[10] Since the data is structured to align with survey rounds, the time periods correspond to the six-month intervals in which the survey takes place.

year in the euro area. This similarity highlights the validity of our results, especially given the differences in the sample coverage and institutional settings. Moreover, our estimated effect is substantially larger than that found by Cloyne et al. (2023) for the U.S. and U.K., likely due to their focus on publicly listed firms, whereas our sample includes a broader set of private companies. Additionally, we observe a U-shaped response of investment to monetary policy, consistent with previous literature, including studies using VAR-based approaches such as Christiano et al. (2005).

Figure 2: Impact of monetary policy on firm-level investment



The figure presents the estimated IRF of monetary policy surprises on firm-level investment using local projection. The regression includes sector and country fixed effects and controls for past investment, leverage, ROE, sales growth, internal funding, liquidity, and past funding needs and availability. We report 90% confidence intervals, calculated using Driscoll-Kraay standard errors, clustered at the firm and time levels.

4.2 The role of needs and availability on monetary policy transmission

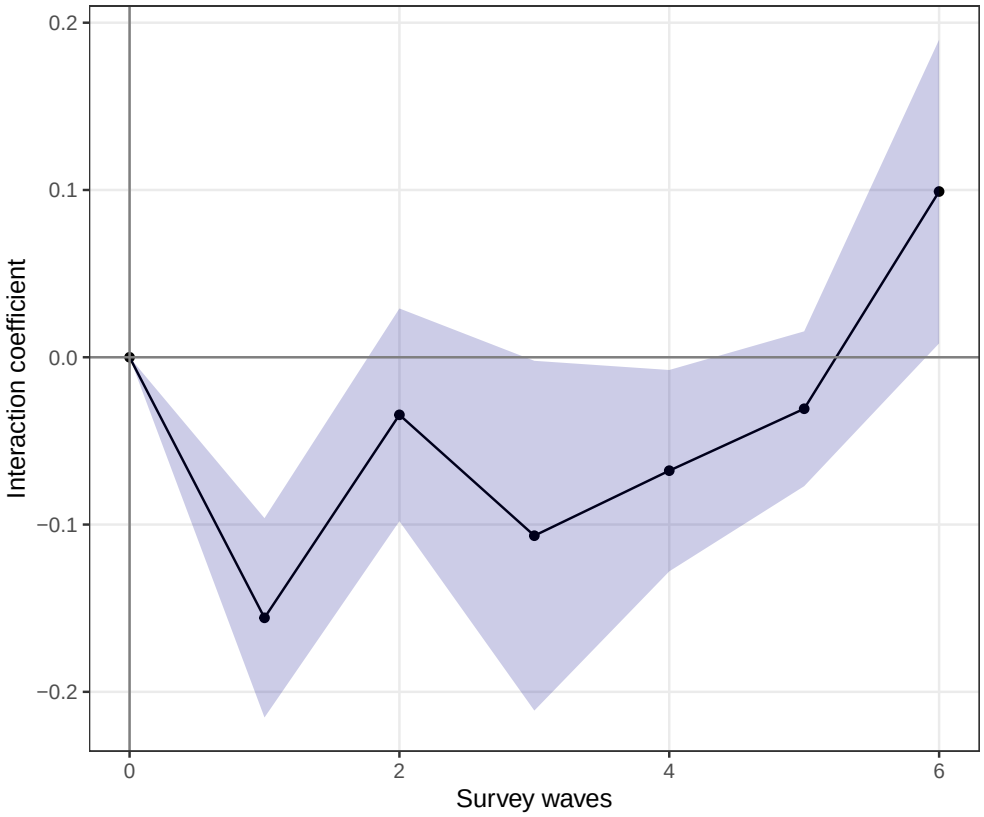
In this section we extend our analysis to the cross-section of firms. As demonstrated earlier, funding needs are closely tied to fundamental structural factors, while funding availability

is strongly associated with financial conditions. With these two variables in hand, we seek to understand how they influence the effect of monetary policy on investment. To achieve this, we extend Equation 2 by incorporating interaction terms with needs and availability. Specifically, we estimate the following extended local projection model:

$$I_{i,t+h} = \alpha_h + \beta_h \cdot mps_t + \phi_h \cdot mps_t \cdot Z_{i,t-1} + \theta_h I_{i,t-1} + \Gamma_h X_{i,t-1} + \gamma_{t,c} + \delta_s + \varepsilon_{i,t+h} \quad (3)$$

where Z represents either funding needs or funding availability at the firm-level. Since our primary interest lies in examining the effects of monetary policy conditional on firm-level characteristics, we include country-by-time fixed effects to account for unobserved macroeconomic factors that vary across countries and over time. However, this approach renders the coefficient of monetary policy (β_h) nonidentifiable. This underscores the importance of our unconditional estimates from the previous section, which serve as a benchmark for comparison. The fact that we find a negative effect of monetary policy on investment unconditionally, is crucial for interpreting our key parameter, ϕ_h. Specifically, a positive estimate of ϕ_h implies that the effect of monetary policy on investment is weaker for firms with higher Z, which means that firms with greater funding needs or availability experience a more muted response to monetary shocks. In contrast, a negative estimate of ϕ_h suggests a stronger monetary policy effect for firms with higher Z, indicating that these firms are more responsive to policy changes.

Figure 3: The role of external funding needs in the monetary policy transmission



The figure presents the estimated IRF of monetary policy surprises interacted with past external funding needs on firm-level investment using local projection. The regression includes sector and country-by-time fixed effects and controls for past investment, leverage, ROE, sales growth, internal funding, liquidity, and past funding needs and availability. We report 90% confidence intervals, calculated using Driscoll-Kraay standard errors, clustered at the firm and time levels.

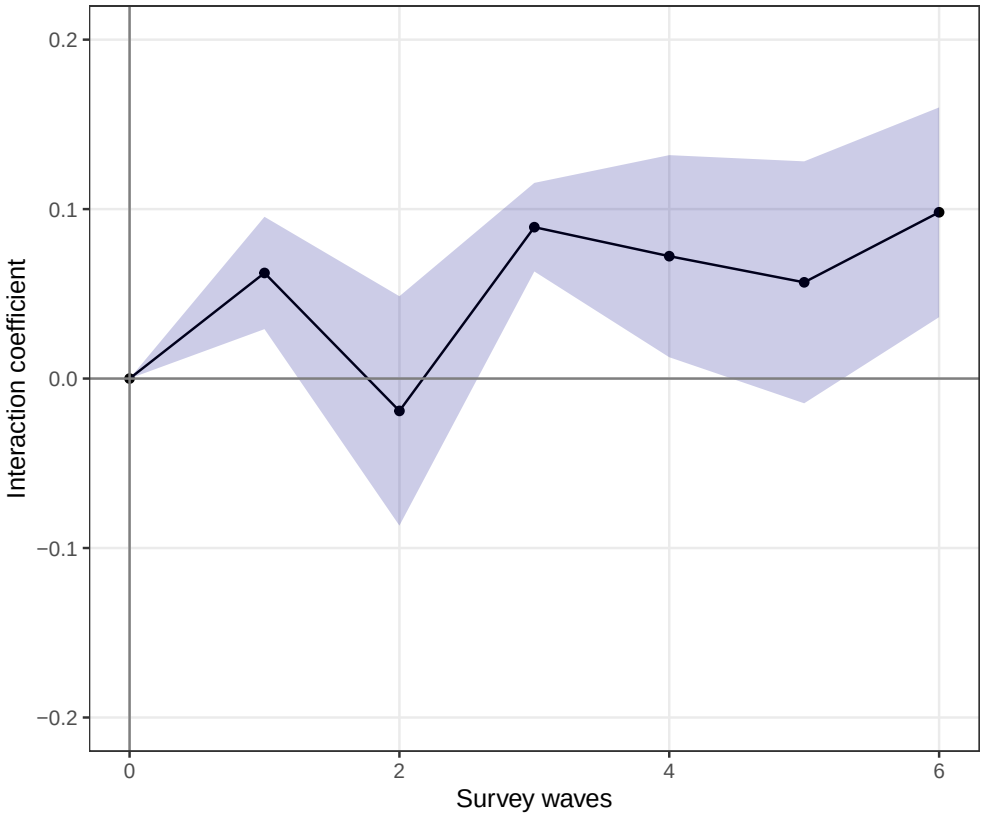
Figure 3 presents the interaction effect from our local projection analysis, where we condition monetary policy surprises on funding needs. Our findings indicate that firms with higher funding needs respond significantly more to monetary policy shocks. Specifically, a one basis point increase in monetary policy surprises leads to an additional 0.15 percentage point decline in investment after six months, provided that funding needs have increased during the last six months (i.e., when needs = 1). In other words, following a monetary easing surprise, firms that reported an increase in funding needs experience, on average, a 0.15 percentage point larger investment increase compared to firms whose funding needs remained unchanged. This effect is also statistically significant for up to 2 years after the shock.

As we have shown, external funding needs are driven primarily by structural factors.

Hence, Figure 3 provides evidence that fundamentals play a key role in the transmission of monetary policy. In particular, our findings indicate that monetary easing is most effective for firms with strong fundamentals. By easing monetary policy, central banks can support investment by loosening financial conditions. From a time-series perspective, this also implies that when financial conditions are tight and structural factors remain weak, the effectiveness of monetary policy is highly constrained. Although a monetary easing surprise may provide some relief, it cannot resolve structural barriers, such as regulatory constraints or uncertainty, that fundamentally shape investment incentives.

To assess whether financial conditions also influence the investment response to monetary policy, we repeat our local projection analysis, this time interacting monetary policy surprises with external funding availability. Figure 4 presents the interaction coefficient estimated from this specification. Our results indicate that the interaction coefficient between monetary policy surprises and external funding availability is positive, suggesting that firms with greater access to external funding are less affected by monetary policy. Specifically, a 1 basis point increase in monetary policy surprises leads to a smaller decline in investment for firms that perceived an increase in funding availability, compared to those for which funding availability remained unchanged. This difference in investment response amounts to 0.1 percentage points after three periods, which is about half the effect observed in Figure 2. This implies that firms with low funding availability react almost twice as strongly to monetary policy surprises as those with greater access to external financing.

Figure 4: The role of external funding availability in the monetary policy transmission



The figure presents the estimated IRF of monetary policy surprises interacted with past external funding availability on firm-level investment using local projection. The regression includes sector and country-by-time fixed effects and controls for past investment, leverage, ROE, sales growth, internal funding, liquidity, and past funding needs and availability. We report 90% confidence intervals, calculated using Driscoll-Kraay standard errors, clustered at the firm and time levels.

Since availability serves as a proxy for financial conditions, we interpret these results as evidence that firms with better financial conditions — or financially unconstrained firms — are less responsive to monetary policy. This finding is consistent with previous empirical studies, such as those of Durante et al. (2022) and Cloyne et al. (2023). The intuition behind this result is straightforward: all else equal, monetary easing is most effective when financial conditions are particularly tight and vice versa. Changes in borrowing costs should have little impact on the investment decisions of firms that consistently secure the funding they need thanks to their strong financial positions.

The fact that financially constrained firms respond more strongly to monetary policy is also consistent with a range of economic models. For example, Bernanke et al. (1999) extend their financial accelerator model to a two-sector framework, where firms face different costs

of external finance, with constrained firms experiencing higher borrowing costs. They show that the investment of firms with limited access to external credit markets increases nearly three times more than the investment of firms with better credit access following a monetary policy shock. Similarly, models with binding credit constraints, such as Kiyotaki and Moore (1997), imply that monetary easing relaxes borrowing constraints, expanding firms' credit capacity and thereby stimulating investment.

5 Conclusion

Our study provides novel insights into how monetary policy transmission to investment is influenced by both fundamental and financial conditions, using survey-based measures of firms' funding needs and availability across the euro area. This approach provides a unique perspective on firms' investment behaviour, complementing traditional accounting-based analyses. By leveraging data from the ECB's Survey on Access to Finance and Enterprise (SAFE), we effectively disentangle the distinct roles that economic fundamentals and financial conditions play in shaping investment decisions across firms of different sizes and financial health.

Our analysis shows that monetary policy is most effective when fundamentals are strong, underscoring the critical role of structural factors, such as economic growth prospects and investment opportunities, in determining the impact of monetary policy on investment. In particular our findings indicate that following a monetary easing surprise, firms that reported an increase in funding needs experience, on average, a 0.2 percentage point larger investment increase compared to firms whose funding needs remained unchanged. This suggests that in environments where fundamentals are weak, efforts by the central banks to stimulate investment through monetary easing may face inherent limitations.

Conversely, we observe that firms with favourable financial conditions, characterized by low leverage and high cash flow, exhibit a muted response to monetary policy changes. This attenuated reaction points to the fact that for firms already experiencing ease in obtaining external finance, additional monetary accommodation may not significantly influence their investment behaviour. Specifically, a 1 basis point increase in monetary policy surprises leads to a decline in investment of 0.1 percentage points less, almost half of the total average effect, for firms that perceived an increase in funding availability, compared to those for which funding availability remained unchanged.

The influence of financial conditions is further affected by firm heterogeneity. Our results show that financially constrained firms, such as small-sized firms and those with higher leverage, are particularly sensitive to changes in monetary policy through the channel of funding availability. This implies that improvements in financial conditions, potentially

facilitated by monetary easing, can substantially enhance investment activity among these firms, in line with the credit channel of monetary policy transmission.

To conclude, our research underscores the complexity of monetary policy transmission to investment, influenced by a combination of structural and financial factors. By highlighting the importance of these factors, we provide additional evidence that can inform more effective policy design, ultimately supporting economic growth and stability. Future research could further explore the dynamic interactions between monetary policy, structural factors, and financial conditions to deepen our understanding of these critical economic relationships.

Appendix

Table A.1: Description of variables

Variable	Type	Description	Source
Needs	Index(-1,1)	Need for external funding	SAFE
Avail	Index(-1,1)	Availability for external funding	SAFE
Lev	Continuous	Financial leverage as ratio of short plus long term debt over total asset.	ORBIS
roe	Continuous	Return on equity	ORBIS
Int_Fund	Continuous	Internal funds as the ratio of capital plus cash flow over total assets	ORBIS
Liq	Continuous	Liquidity as current assets minus inventories over current liabilities	ORBIS
Sales_gr	Continuous	Sales growth	ORBIS
SME	Dummy	Equal to 1 for firms with less than 250 employees	ORBIS
LogTA	Continuous	Logarithm of total assets	ORBIS
Debt_Burd	Continuous	Debt burden as interest expenses over earnings before interest and taxes	ORBIS

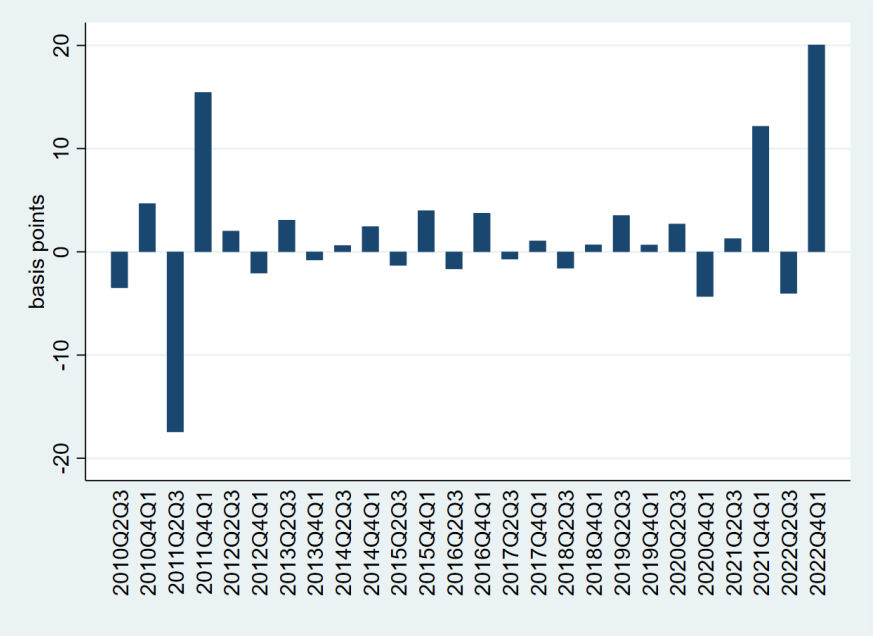
Note. The table gives a detailed description of the variables used in the analysis, their type and the source.

Table A.2: Correlation of needs and availability with accounting variables

	Inv_{t+1}	$Needs_t$	$Avail_t$	Lev_t	roe_t	Int_Fund_t	Liq_t	$Sales\_gr_t$	SME	$LogTA_t$
$Needs_t$	0.05									
$Avail_t$	0.06	-0.05								
Lev_t	-0.05	0.06	-0.02							
roe_t	0.07	-0.02	0.06	-0.03						
Int_Fund_t	0.01	-0.05	0.05	-0.12	0.12					
Liq_t	0.05	-0.07	0.01	-0.16	0.02	0.09				
$Sales\_gr_t$	0.08	0.01	0.07	-0.03	0.12	0.08	-0.03			
SME	-0.01	-0.01	-0.04	0.01	-0.01	-0.04	0.03	-0.01		
$LogTA_t$	0.02	0.02	0.07	0.05	-0.01	0.01	-0.06	0.00	-0.51	
$Debt\_Bur_t$	-0.11	0.07	-0.12	0.33	-0.28	-0.23	-0.17	-0.16	0.07	-0.10

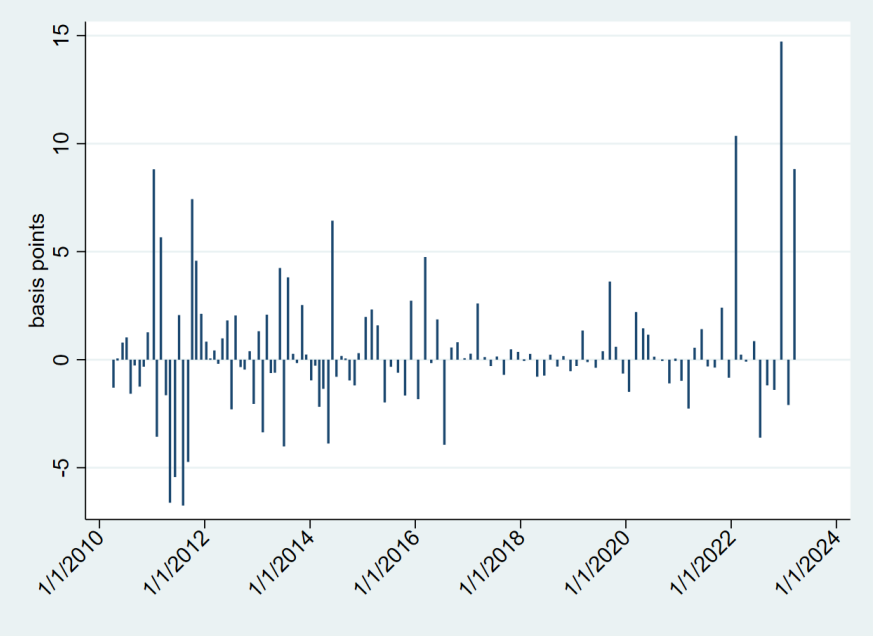
Note. The table shows the weighted (see notes to Table 1) correlations between the variables used in the analysis. The correlations are all significant at 1% with the exceptions of those in italics that are not significant. For a detailed description of variables see Table A.1. Source: authors elaboration on SAFE-ORBIS dataset.

Figure A.1: Monetary policy surprises



Note. The figure shows the forward guidance surprises aggregated at wave level. Source: authors elaboration on Euro Area Monetary Policy Event-Study Database (EA-MPD).

Figure A.2: Monetary policy surprises



Note. The figure shows the forward guidance surprises monthly series. Source: authors elaboration on Euro Area Monetary Policy Event-Study Database (EA-MPD).

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