Investment and Financial Constraints in a High-Inflation Economy: The Case of Turkey

Preliminary Version

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Abstract

This study explores the impact of financial constraints on investment behavior in a high-inflation economy, with a focus on Turkey's post-2020 period of unconventional monetary policy. Utilizing industry-level data from the CBRT Company Sector Database (2009–2023, NACE-2 classification), we employ a fixed-effects panel regression model to examine how monetary policy, financial ratios, and the prevalence of small firms influence investment dynamics. The results indicate that the financial accelerator mechanism operates as expected, with more constrained firms exhibiting stronger sensitivity to monetary conditions. For post-2020 period, we find that the fundamental relationship between financial constraints and investment changed. While reliance on short-term debt became less restrictive for investment—possibly due to liquidity injections or policy support—industries with higher long-term debt exposure experienced a decline in investment sensitivity, likely driven by heightened uncertainty and a shift toward deleveraging. These findings suggest that expansionary monetary policy, when accompanied by elevated risk, can lead to inefficiencies by distorting credit allocation towards riskier firms, potentially undermining long-term output growth and financial stability.

JEL Codes: C33, E52

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1 Introduction

In emerging markets, monetary policy operates under unique constraints, where central banks must address the coincident and often conflicting pressures of price stability, output growth, and financial stability. In addition, monetary transmission can be incomplete or delayed due to factors such as exchange rate volatility, risk premium fluctuations, and global financial conditions. Finally, a lack of strong institutional structures may undermine the credibility or operational independence of central banks, leading not only to shifts between different policy objectives but also to unintended consequences of monetary policy.

Following the Global Financial Crisis, Turkey's monetary policy trajectory increasingly diverged from the conventional framework, with its most drastic shift occurring after 2021. Increased global liquidity weakened the trade-off between financial and price stability, prompting the central bank to devise an unconventional policy mix that later evolved into a tool for the government to influence the monetary stance. Over time, monetary policy became increasingly discretionary, shaped by political interventions and a preference for procyclical easing. This trend accelerated after 2013, when the central bank faced growing political pressure to maintain low interest rates, leading to repeated credibility shocks (Gürkaynak et al., 2015). The post-pandemic period marked the most extreme phase of this trajectory: between 2021 and 2023, Turkey actively lowered interest rates despite surging inflation. Although intended to stimulate growth, this policy paradoxically fueled macroeconomic instability, rapid currency depreciation, and soaring inflation (Gürkaynak et al., 2023). During this period, expansionary monetary policy heightened macroeconomic uncertainty, leading to a sharp depreciation of the Turkish lira and a substantial rise in the country's risk premium. This surge further isolated the economy from international financial markets, exacerbating the disconnect between the policy rate and market rates (Kara and Sarıkaya, 2024). Therefore, this policy shift provides a natural experiment to examine how expansionary monetary policy interacts with rising risk premiums, shaping firm- and industry-level financial conditions and their consequences on firm performance indicators.

The seminal work of Gertler and Gilchrist (1994) highlights how credit channel through financial constraints shape firm responses to monetary policy. Small firms, reliant on bank loans and with limited access to capital markets, face sharper declines in sales, inventories, and short-term debt following monetary tightening, while large firms mitigate shocks through greater financial flexibility. The effects of monetary policy at the industry level have also been studied, revealing significant heterogeneity in sectoral responses over time. Dedola and Lippi (2005) analyze industry-level data from five OECD countries and find that sectoral output responses

to monetary policy shocks are systematically related to characteristics such as output durability, financing requirements, and firm size, emphasizing the role of financial frictions. Peersman and Smets (2005) extend this analysis to the euro area, showing that monetary policy effects are stronger during recessions, particularly in industries with higher financial leverage and short-term debt dependence. More recently, Choi et al. (2024) examine a broader dataset covering 102 countries and 22 industries, confirming that monetary contractions disproportionately impact industries with assets that are difficult to collateralize and those composed of smaller firms. These findings collectively highlight the importance of industry characteristics in shaping the transmission of monetary policy.

Changing risk preferences is an additional channel through which monetary policy influences economic activity, typically moving in the same direction under credible and conventional policy frameworks. In advanced economies, easing monetary policy can boost risk appetite by improving economic and financial conditions by enhancing the economic outlook, reducing uncertainty, and strengthening balance sheets for both borrowers and lenders (Bauer et al., 2023). However, in emerging markets, the relationship between monetary policy and risk perception is far more complex, as it is shaped by additional factors such as external financial conditions, institutional credibility, and macroeconomic stability. In these economies, expansionary monetary policy may fail to stimulate risk appetite or even work in the opposite direction if it amplifies existing vulnerabilities, such as rising country risk premiums or currency depreciation.

Rising risk premiums can tighten financial conditions across all firms, narrowing the gap between small and large firms while reshaping credit allocation across industries. When monetary policy amplifies risk premiums, it weakens the credit channel by increasing uncertainty, undermining investor confidence, and potentially negating its intended stimulus effects. Rather than uniformly easing financial constraints, expansionary monetary policy in high-risk environments may disproportionately channel financing into weaker firms, which increase their reliance on both short-term and long-term debt to sustain operations. Meanwhile, industries dependent on long-term financing may deleverage in response to rising risk premiums, effectively being crowded out of the credit market. This adverse selection in credit allocation highlights the distortionary effects of weak monetary policy transmission in high-risk settings, where expansionary policy can reinforce financial fragility rather than support investment.

In this paper, we examine how financial constraints and industry characteristics shape investment behavior by estimating a fixed-effects panel regression model using sectoral data from the CBRT Company Sector Database for the period 2009–2023, with a particular focus on the post-COVID period during which expansionary monetary policy was coupled with rising risk

premiums. In addition, we test the existence of credit channel for monetary policy by using real interest rate as our monetary policy stance.

Our results confirm that financial constraints play a critical role in shaping investment decisions at the industry level. High leverage is consistently associated with lower investment intensity, particularly in industries reliant on short-term financing. In particular, we find that while long-term debt positively influences investment, short-term debt constrain firms' ability to allocate resources toward capital formation. We also find that industries dominated by small firms exhibit lower investment intensity, reinforcing the notion that credit market frictions disproportionately impact smaller firms. In addition, our findings demonstrate that monetary policy interacts with the financial structure of industries, confirming that the credit channel remains operative, consistent with the existing literature.

A key contribution of our study is the analysis of the post-2020 period, marked by an unconventional monetary policy regime in Turkey. We find that the fundamental relationship between financial constraints and investment changed during this period. While reliance on short-term debt became less restrictive for investment—possibly due to liquidity injections or policy support—industries with higher long-term debt exposure experienced a decline in investment sensitivity, likely driven by heightened uncertainty and a shift toward deleveraging. These findings suggest that expansionary monetary policy, when accompanied by elevated risk, can lead to inefficiencies by distorting credit allocation towards riskier firms, potentially undermining long-term output growth financial stability.

Our findings contribute to the growing literature on monetary policy transmission in emerging markets by pointing out how financial constraints and weak monetary policy shape investment decisions. By examining industry-level responses to monetary easing in a high-risk environment, we provide some preliminary evidence on the potential unintended consequences of expansionary policies in emerging markets such as reinforcing financial fragility rather than stimulating investment. While we do not directly establish this interaction yet in this version, our findings point to its relevance, and in future versions of this study, we aim to explore this relationship in more depth.

Outline of the paper is as follows. Section 2 presents the data, Section 3 outlines the model and presents the result, finally Section 4 concludes.

2 Data

We use sectoral data obtained from the CBRT Company Sector Database, covering the period from 2009 to 2023 with a yearly frequency. The data originates from company accounts based

on balance sheets and income statements of real sector enterprises, provided by the Revenue Administration. These individual datasets are aggregated by sector and scale for each reporting period.

The scale dimension categorizes firms into SMEs and large enterprises, based on the size classification defined by the Ministry of Industry and Technology. The sector classification follows the NACE Rev.2 economic activity classification system. The dataset represents a balanced panel, disaggregated by sector, scale, and year.

To examine the role of financial constraints in shaping industry-level responses to monetary policy, we incorporate several balance sheet indicators as proxies for the financial accelerator mechanism. These include leverage (total debt over total assets), debt maturity structure (short-term over total debt and long-term debt over total assets), working capital requirements, and the ability to cover financial costs (cash flow over interest payments).

Financial leverage captures the extent to which firms rely on external financing. While highly leveraged firms may face greater financing constraints. leverage can also signal borrowing capacity, allowing firms to access credit on better terms, potentially making them less sensitive to monetary policy shocks.

The short-term debt ratio (short-term over total debt) measures the extent to which firms rely on short-term financing rather than long-term loans. In the presence of credit frictions, firms with a greater reliance on short-term debt are expected to be more sensitive to monetary policy changes, particularly in a recession.

The long-term debt ratio (long-term debt over total assets) captures the extent to which firms have access to stable, long-term financing. Industries with higher long-term debt ratios may be less affected by monetary tightening, as long-term debt provides financial stability and reduces firms' exposure to short-term credit fluctuations.

Firms' liquidity positions affect their ability to undertake investments as well. The working capital ratio is computed as the difference between current assets and short-term liabilities divided by total liabilities. This ratio indicates a firm's capacity to cover short-term obligations and maintain financial flexibility. A higher working capital ratio suggests a stronger liquidity position, which may facilitate investment decisions.

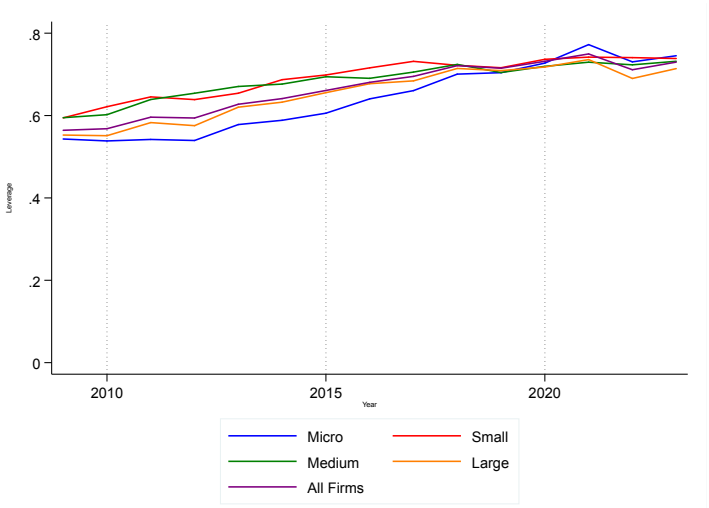
Our dependent variable is investment to capital share. This variable defined as the ratio of investment to total fixed assets. Investment is calculated as the difference in fixed assets between two consecutive periods for firms with the same industry code and scale. This variable has been used as proxy for investment intensity by taking the proportion of newly acquired fixed assets relative to the existing stock of fixed assets.

Table 1 provides summary statistics for key financial ratios across different firm sizes (Large, Medium, Small, Micro). Short-term debt ratios tend to be lower for large firms compared to micro and small firms, implying that smaller firms rely more on short-term financing. The long-term debt to assets ratio is higher for larger firms, reflecting their greater access to long-term financing. Short-term trade credit is higher for smaller firms, suggesting that they rely more on supplier financing due to limited access to traditional credit markets. Leverage is generally higher for large firms, indicating a greater reliance on external financing. Larger firms tend to have better credit access and lower borrowing costs, allowing them to sustain higher leverage. Conversely, smaller firms may face higher interest rates and borrowing constraints, limiting their ability to take on additional debt. This aligns with the composition of short- and long-term financing at different firm size levels. Working capital is significantly lower for micro and small firms, with some firms even displaying negative working capital values. This suggests greater liquidity constraints and cash flow challenges, making them more vulnerable to financial shocks. In contrast, larger firms have higher working capital levels, providing them with greater financial flexibility.

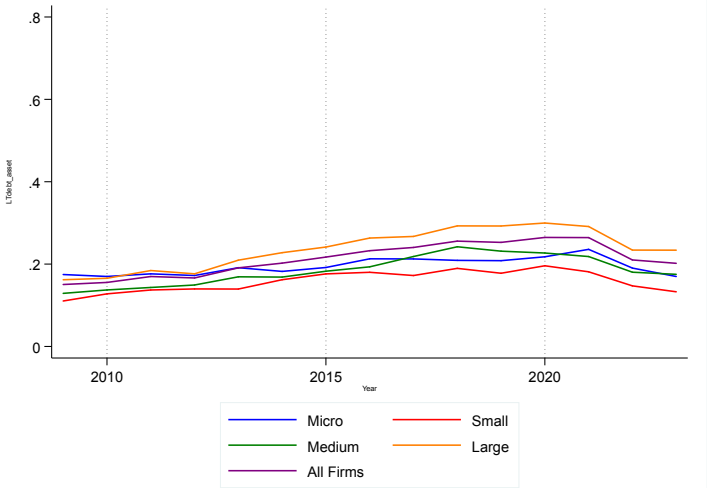
Figures 1 and 2 illustrate key financial ratios across firms of different sizes over time. Larger firms consistently exhibit greater access to long-term debt, and stronger working capital positions, reflecting their financial stability and easier access to credit markets. In contrast, micro and small firms rely more on short-term debt, trade credit, and have persistently lower or even negative working capital, signaling greater financial fragility and borrowing constraints. During Post-2020 period, one notable trend is the decline in leverage and long-term debt ratios for some firms, which may indicate a flight to safety amid rising uncertainty. While expansionary policies were intended to stimulate investment and credit growth, the simultaneous increase in risk premiums and macroeconomic instability seems to have discouraged long-term commitments, pushing firms toward short-term liquidity management rather than expansionary investment. This is particularly visible in smaller firms, where persistent working capital constraints suggest that monetary easing failed to provide sufficient financial relief, potentially due to higher inflation eroding real borrowing benefits.

As a measure for monetary policy stance we use real interest rate which is the difference between average cost of funding minus the inflation expectations. The average cost of funding refers to the average interest rate at which the central bank provides funds to the market, primarily through various liquidity facilities. This measure includes the cost of borrowing from the central bank's discount window and other short-term funding mechanisms, such as overnight or repo operations. Unlike the policy rate, which is a benchmark rate officially set by the

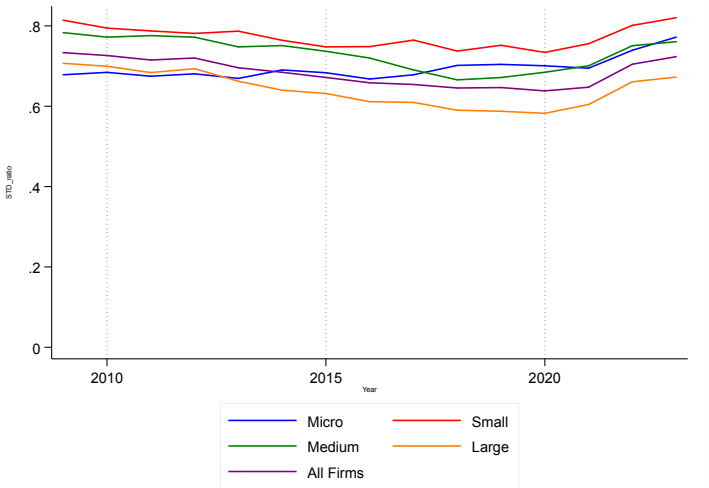
central bank, the average cost of funding reflects the actual borrowing costs incurred by financial institutions in the market. The central bank can influence this cost without adjusting the policy rate, particularly during periods of unconventional monetary policy, by altering the availability and conditions of liquidity through the discount window. This allows the central bank to raise borrowing costs in the market effectively, managing liquidity and controlling inflationary pressures, even when the official policy rate remains unchanged.



(a) Leverage

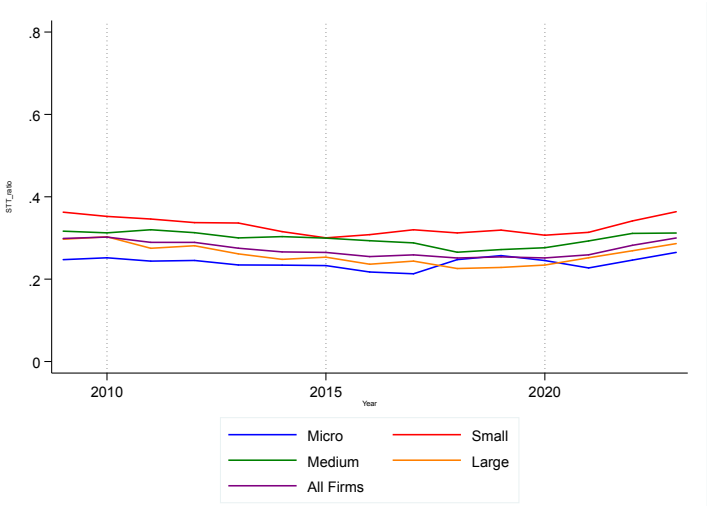


(b) LT Debt to Asset

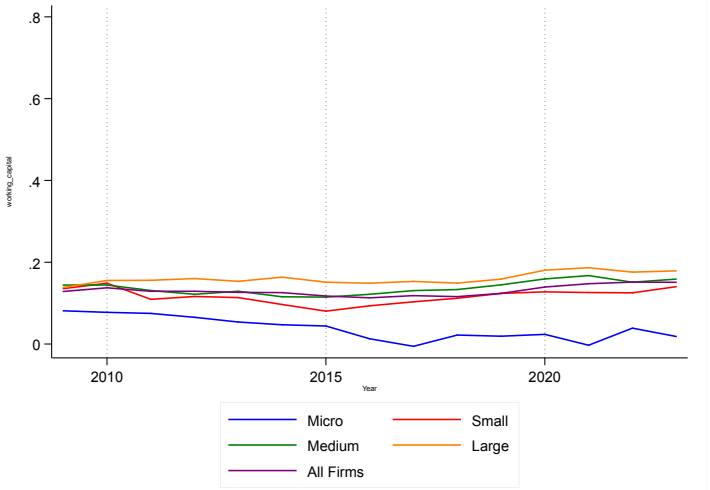


(c) STD Ratio

Figure 1: Financial Ratios (Part 1)



(a) STT Ratio



(b) Working Capital

Figure 2: Financial Ratios (Part 2)

3 Empirical Model and Results

In this section, we first present the baseline specification, followed by an analysis of the interaction between monetary policy and financial constraints. Finally, we examine how investment dynamics evolved in the post-2020 period under unconventional monetary policy.

3.1 Baseline Specification

To analyze the determinants of investment intensity, we estimate a fixed-effects panel regression model. The dependent variable, *Investment-to-Capital Share*, represents investment intensity,

calculated as the ratio of investment to total fixed assets. The independent variables include industry level financial ratios, macroeconomic factors, and demand conditions. The general specification of our regression model is as follows:

$$\begin{aligned} Inv_to_Cap_Share_{i,t} = \beta_0 + \beta_1 Ratio_{i,t} + \beta_2 Leverage_{i,t} + \beta_3 MacroVar_t \\ + \beta_4 \ln IndustrySize_{i,t} + \beta_5 GDP_Growth_t + \alpha_i + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Investment intensity, denoted as $Inv_to_Cap_Share_{i,t}$, represents the ratio of investment to total fixed assets for sector and scale i in year t. The term $Ratio_{i,t}$ includes financial indicators such as short-term debt to total debt ratio (STD_Ratio), long-term debt to assets ratio ($LTdebt_Asset$), short-term trade debt ratio (STT_Ratio), sectoral financial intensity (SFI_Sales), and working capital ratio ($Working_Capital$). The leverage variable, $Leverage_{i,t}$, measures the proportion of a firm's assets that are financed through debt.

Macroeconomic indicators, represented by $MacroVar_t$, include the credit default swap spread (CDS_{high}), the market volatility index (VIX_{close}), and exchange rate volatility ($FXVol$). The variable $\ln IndustrySize_{i,t}$ represents the natural logarithm of total sectoral sales, reflecting industry size. The term GDP_Growth_t accounts for global GDP growth, capturing macroeconomic conditions. In some specifications, as an alternative measure to industry-level sales, we rely on domestic real GDP growth to account for local demand conditions. Firm-specific fixed effects are denoted by α_i, controlling for unobserved heterogeneity, while $\varepsilon_{i,t}$ is the error term.

Table 2 presents the correlation matrix of the main variables used in the regression, with highly correlated variables highlighted to identify potential collinearity concerns. In particular, macro volatility measures—including CDS spreads and FX volatility—exhibit strong correlations. Additionally, leverage and working capital, as well as long-term debt and short-term debt, are highly correlated. Therefore, in our regressions, we use these variables separately.

Baseline regression results are presented in Table 3 and Table 4.[1] The results show that leverage is negative and significant in all specifications, indicating that highly leveraged industries are constrained in making investments. Debt maturity dynamics further support these findings, as long-term debt positively influences investment intensity, while short-term debt has the opposite effect, limiting industries' capacity to invest. The working capital measure is insignificant. Additionally, the small firm intensity measure indicates that industries dominated by small firms are less likely to make investments. The results are confirmed in alternative specifications, where we use other macroeconomic measures such as exchange rate volatility and the

[1] These tables use domestic GDP growth and industry-level sales measures interchangeably to address potential collinearity issues stemming from the high correlation between CDS measures and industry sales.

CBOE VIX as a global volatility measure. These alternative specifications are presented in the appendix.

These findings suggest that, during the period under investigation, financial constraints operated in line with theoretical expectations. Industries facing higher leverage were more restricted in their ability to allocate resources toward investment. The maturity structure of debt played a critical role, with long-term financing supporting investment, while short-term debt increase liquidity pressures and reduce investment capacity. The negative impact of working capital suggests that industries requiring significant short-term liquidity are more focused on maintaining operational stability rather than expanding investment. Similarly, the lower investment propensity in small firm-dominated industries aligns with existing evidence on credit market frictions, where smaller firms typically face higher borrowing costs and limited access to external financing. Taken together, these results confirm that credit constraints were a key determinant of investment dynamics, shaping industry-level responses to macroeconomic conditions.

Table 1: Summary Statistics by Firm Scale

Scale	STD Ratio	LTdebt/Assets	STT Ratio	Working Capital	Leverage
Large					
Min	0.18	0.05	0.03	-0.20	0.28
P10	0.41	0.10	0.09	0.02	0.47
P25	0.56	0.14	0.15	0.10	0.56
Mean	0.64	0.23	0.24	0.17	0.64
P50	0.69	0.19	0.24	0.18	0.64
P75	0.77	0.29	0.32	0.25	0.73
P90	0.83	0.41	0.41	0.33	0.82
Max	0.95	1.36	0.65	0.53	1.60
N	780	780	780	780	780
Medium					
Min	0.31	0.04	0.05	-0.24	0.33
P10	0.52	0.07	0.13	-0.05	0.54
P25	0.69	0.11	0.22	0.04	0.61
Mean	0.74	0.18	0.30	0.12	0.67
P50	0.77	0.14	0.32	0.14	0.67
P75	0.83	0.20	0.38	0.21	0.75
P90	0.89	0.33	0.45	0.27	0.83
Max	0.98	0.68	0.65	0.48	1.13
N	990	990	990	990	990
Small					
Min	0.34	0.03	0.07	-0.30	0.36
P10	0.64	0.06	0.16	-0.10	0.54
P25	0.76	0.09	0.24	0.01	0.64
Mean	0.79	0.14	0.30	0.09	0.71
P50	0.83	0.12	0.35	0.11	0.71
P75	0.87	0.17	0.41	0.17	0.76
P90	0.90	0.25	0.46	0.22	0.83
Max	0.97	0.62	0.67	0.38	1.44
N	1110	1110	1110	1110	1110
Micro					
Min	0.18	0.02	0.06	-0.40	0.22
P10	0.56	0.06	0.12	-0.17	0.46
P25	0.72	0.08	0.19	-0.05	0.60
Mean	0.78	0.14	0.28	0.09	0.69
P50	0.83	0.12	0.27	0.04	0.70
P75	0.88	0.19	0.36	0.11	0.78
P90	0.91	0.30	0.41	0.19	0.89
Max	0.98	1.61	0.74	0.79	2.72
N	1110	1110	1110	1110	1110

Table 2: Correlation Matrix

	Leverage	STD Ratio	LTdebt Asset	STT Ratio	Working Capital	CDS	VIX	FX Vol	Industry Size	DGDP Growth	WGDP Growth
Leverage	1.00	-0.06	0.43	-0.03	-0.50	0.19	-0.11	0.16	0.15	0.02	0.02
STD Ratio	-0.06	1.00	-0.89	0.66	0.07	0.03	0.04	0.02	-0.11	0.02	0.08
LTdebt Asset	0.43	-0.89	1.00	-0.57	-0.18	0.04	-0.06	0.04	0.14	-0.00	-0.05
STT Ratio	-0.03	0.66	-0.57	1.00	0.25	0.02	0.01	0.02	0.07	0.01	0.03
Working Capital	-0.50	0.07	-0.18	0.25	1.00	0.01	0.06	0.01	0.11	0.01	0.02
CDS	0.19	0.03	0.04	0.02	0.01	1.00	0.35	0.82	0.44	-0.05	0.17
VIX	-0.11	0.04	-0.06	0.01	0.06	0.35	1.00	0.39	-0.04	-0.20	-0.13
FX Vol	0.16	0.02	0.04	0.02	0.01	0.82	0.39	1.00	0.35	0.15	0.01
Industry Size	0.15	-0.11	0.14	0.07	0.11	0.44	-0.04	0.35	1.00	0.08	0.20
DGDP Growth	0.02	0.02	-0.00	0.01	0.01	-0.05	-0.20	0.15	0.08	1.00	0.65
WGDP Growth	0.02	0.08	-0.05	0.03	0.02	0.17	-0.13	0.01	0.20	0.65	1.00

Table 3: Regression Results for the Baseline Model with CDS

VARIABLES	(1)	(2)	(3)	(4)	(5)
STD_ratio	-0.386***				
	(0.107)				
LTD/Assets		0.511***			
		(0.152)			
STT_ratio			-0.498***		
			(0.160)		
SFI/Sales				0.157	
				(0.375)	
Working capital					-0.0359
					(0.0964)
Leverage	-0.308***	-0.466***	-0.287***		
	(0.0785)	(0.116)	(0.0732)		
ln(Industry size)	0.0718***	0.0727***	0.0705***	0.0660***	0.0543***
	(0.0129)	(0.0132)	(0.0130)	(0.0137)	(0.0114)
CDS	0.000171***	0.000166***	0.000170***	0.000175**	0.000194***
	(6.06e-05)	(6.14e-05)	(6.24e-05)	(6.78e-05)	(6.21e-05)
World GDP growth	0.00374***	0.00356***	0.00353***	0.00337***	0.00361***
	(0.00109)	(0.00110)	(0.00111)	(0.00110)	-0.0011
Observations	3,724	3,724	3,724	3,724	3,724
R-squared	0.071	0.072	0.070	0.065	0.069
Number of panels	266	266	266	266	266

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Year Fixed Effects: No, Panel Fixed Effects: Yes

3.2 Interaction with Monetary Policy

In this section, we examine how the real interest rate interacts with key financial ratios to influence investment dynamics. In this analysis, we use the real interest rate because changes in the policy interest rate— proxied by the average cost of funding is not informative for monetary policy stance over the whole sample. The post-2020 period has been characterized by accelerating inflation expectations, leading to a negative real interest rate environment. The real

Table 4: Regression Results for the Baseline Model with CDS

VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
STD_ratio	-0.397***				
	(0.109)				
LTD/Assets		0.499***			
		(0.151)			
STT_ratio			-0.462***		
			(0.157)		
SFI/Sales				-0.120	
				(0.394)	
Working capital					-0.0823
					(0.101)
Leverage	-0.206***	-0.358***	-0.186**	-0.149**	
	(0.0754)	(0.108)	(0.0728)	(0.0744)	
CDS	0.000493***	0.000493***	0.000489***	0.000475***	0.000446***
	(3.59e-05)	(3.65e-05)	(3.54e-05)	(3.53e-05)	(2.87e-05)
World GDP growth	0.00124	0.00120	0.00143	0.00160	0.00321
	(0.00111)	(0.00112)	(0.00110)	(0.00111)	(0.000632)
Domestic GDP growth	0.00346***	0.00333***	0.00306***	0.0144	0.00275***
	(0.000722)	(0.000700)	(0.000691)	(0.000653)	(0.0136)
Observations	3,724	3,724	3,724	3,724	3,724
R-squared	0.068	0.068	0.066	0.062	0.060
Number of panels	266	266	266	266	266

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Year Fixed Effects: No, Panel Fixed Effects: Yes

interest rate is calculated as the difference between the average cost of funding and household inflation expectations. [2]

The specification of our regression model is as follows:

$$\begin{aligned} Inv_to_Cap_Share_{i,t} = \beta_0 + \beta_1 Ratio_{i,t} + \beta_2 RealInterestRate_t + \beta_3 Leverage_{i,t} \\ + \beta_4 MacroVar_t + \beta_5 (Ratio_{i,t} \times RealInterestRate_t) + \beta_6 \ln IndustrySize_{i,t} \\ + \beta_7 GDP_Growth_t + \alpha_i + \varepsilon_{i,t} \end{aligned} \tag{2}$$

where $RealInterestRate_t$ is the real interest rate at time t, $Ratio_{i,t} \times RealInterestRate_t$ is an interaction term capturing the differential effect of financial ratios in response to changes in real interest rates.

This model enables us to evaluate how real interest rates interact with financial ratios in determining investment intensity. The interaction term ($Ratio_{i,t} \times RealInterestRate_t$) allows us to analyze whether the effect of a given financial ratio on investment behavior is amplified or mitigated by real interest rate movements. A positive coefficient on this term would suggest that the relationship between financial ratios and investment intensity strengthens when real interest rates rise (monetary tightening), while a negative coefficient would indicate the opposite effect. To ensure robustness, we employ panel fixed effects (α_i) and cluster standard errors at the panel level to account for within-panel correlation.

Table 5 presents regression results examining how real interest rate interactions with key financial ratios influence investment intensity. The interaction terms in this model measure whether firms' financial characteristics amplify or mitigate the effects of monetary tightening (higher real interest rates) on investment.

The coefficient on the real interest rate is consistently negative and significant, implying that higher real interest rates reduce investment intensity across all specifications. This supports the idea that monetary tightening constrains firm investments by increasing borrowing costs and reducing credit availability. The leverage coefficient remains negative and significant, indicating that highly leveraged firms face stronger constraints in making investments. This suggests that firms with higher debt burdens are more vulnerable to rising interest rates consistent with the financial accelerator mechanism.

The interaction term for short-term debt ratio and real interest rate is negative but statistically insignificant, suggesting that short-term debt exposure does not significantly alter firms'

[2] Although inflation expectations data have been available since 2013, sectoral-level expectations are only available from 2015 onward. Therefore, we rely on household inflation expectations to calculate the real interest rate to avoid losing additional data points.

sensitivity to changes in real interest rates. However, the interaction term for long-term debt to assets ratio and real interest rate is positive and significant, implying that firms with higher long-term debt are less negatively affected by monetary tightening. This may be because long-term financing protects firms from immediate interest rate fluctuations. The interaction term for short-term trade credit ratio and real interest rate is negative but insignificant, indicating that reliance on trade credit does not significantly alter investment sensitivity to interest rate changes. The coefficient on working capital remains negative and significant only at the 10% level, suggesting that firms with greater liquidity hold back on investments during periods of monetary tightening.

These findings align with the existing literature, which highlights the role of financial structure in shaping monetary policy transmission. Consistent with studies emphasizing the stabilizing effect of long-term debt, our results suggest that industries with higher long-term financing are less affected by interest rate increases. In contrast, firms reliant on short-term financing and working capital face greater constraints, reinforcing the view that financial frictions amplify the impact of monetary tightening on investment decisions.

3.3 Post-2020 Investment Behavior

The results discussed so far corresponds the entire period covered in our analysis. However, the post-2020 period, marked by unconventional monetary policies, represents a sharp departure from traditional monetary transmission dynamics. Between 2021 and 2023, interest rates were lowered despite high inflation, leading to heightened macroeconomic uncertainty, currency depreciation, and a sharp rise in risk premiums. In this context, we specifically investigate if the fundamental relationship between investment behavior and debt structure has evolved, assessing whether changes in financial conditions and risk perceptions have influenced firms' investment decisions differently compared to earlier periods. The post-2020 monetary environment, characterized by heightened uncertainty and shifting credit conditions, offers a unique setting to assess whether traditional investment dynamics still apply or if rising financial risks have altered the relationship between monetary policy, leverage, debt composition, and investment decisions.

To examine potential changes in investment dynamics, we introduce an interaction term with a post-2020 period dummy variable in our baseline regression. This approach allows us to assess whether the relationship between financial structure and investment behavior has shifted in response to the unique economic conditions of the post-pandemic period. By incorporating a dummy variable, we can capture these dynamics without relying on a specific proxy for monetary policy stance.

The regression specification we employed is given below:

$$\begin{aligned} Inv_to_Cap_Share_{i,t} = \beta_0 + \beta_1 Ratio_{i,t} + \beta_2 Post2020_t + \beta_3 Leverage_{i,t} \\ + \beta_4 MacroVar_t + \beta_5 (Ratio_{i,t} \times Post2020_t) + \beta_6 \ln IndustrySize_{i,t} \\ + \beta_7 World_GDP_Growth_t + \alpha_i + \varepsilon_{i,t} \end{aligned} \tag{3}$$

where $Post2020_t$ is a dummy variable indicating the post-2020 period, and $Ratio_{i,t} \times Post2020_t$ is an interaction term capturing the differential effect of financial ratios in the post-2020 period. All other terms have been defined in previous discussions. The interaction term $(Ratio_{i,t} \times Post2020_t)$ measures whether the relationship between financial ratios and investment intensity changed after 2020. A positive coefficient would imply that the effect of financial ratios on investment has strengthened in the post-2020 period.

Table 6 presents regression results analyzing how investment behavior changed in the post-2020 period. The coefficient on the post-2020 dummy is negative and significant, confirming that investment intensity declined in the post-pandemic period. The leverage effect remains consistently negative, reinforcing that highly indebted firms are more constrained in making investments, particularly in the post-2020 period.

The results suggest that the post-2020 monetary environment affected the relationship between financial structure and investment behavior at the industry level. The positive and significant interaction term for short-term debt indicates that industries relying more on short-term financing became less sensitive to its negative effects on investment, likely due to liquidity injections or policy support that temporarily eased short-term financial pressures. In contrast, the negative and significant interaction term for long-term debt suggests that industries with higher long-term leverage experienced a decline in investment sensitivity to debt levels. This could be attributed to rising macroeconomic uncertainty, policy unpredictability, and elevated risk premiums, which may have led industries to deleverage rather than expand investment. As a result, while short-term liquidity measures may have influenced financing dynamics, industries with higher long-term debt exposure may have responded by reducing leverage rather than increasing investment, reflecting a shift in financial decision-making under heightened uncertainty.

We conducted the same analysis using alternative measures that differentiate industries based on their reliance on external financing. The interaction term for short-term trade credit ratio and post-2020 is positive and significant, suggesting that industries more dependent on trade credit became less sensitive to its effects on investment, possibly due to improved supplier credit conditions. Similarly, the interaction term for small firm intensity and post-2020 is

positive and significant, indicating that industries with a higher share of small firms exhibited reduced sensitivity in their investment decisions after 2020. In contrast, the interaction term for working capital and post-2020 is negative but statistically insignificant, implying that the role of working capital in shaping investment behavior remained largely unchanged in the post-2020 period.

Table 5: Regression Results for the Interest Rate Interaction

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Real interest rate	-0.00331**	-0.00585***	-0.00394***	-0.00423***	-0.00449***	-0.00361***	-0.00608***	-0.00422***	-0.00448***	-0.00481***
	(0.00139)	(0.000737)	(0.000830)	(0.000650)	(0.000599)	(0.00137)	(0.000719)	(0.000829)	(0.000646)	(0.000598)
Leverage	-0.184**	-0.349***	-0.166**	-0.112		-0.188**	-0.348***	-0.172**	-0.119	
	(0.0781)	(0.108)	(0.0766)	(0.0740)		(0.0776)	(0.107)	(0.0760)	(0.0736)	
STD_ratio	-0.535***					-0.522***				
	(0.136)					(0.135)				
STD_ratio × Real interest rate	-0.00248					-0.00240				
	(0.00160)					(0.00159)				
ln(Industry size)	0.0280**	0.0268**	0.0273**	0.0210*	0.0164	0.00879	0.00759	0.00668	-0.000623	-0.00408
	(0.0108)	(0.0110)	(0.0121)	(0.0110)	(0.0112)	(0.0123)	(0.0125)	(0.0136)	(0.0128)	(0.0129)
World GDP growth	0.00507***	0.00492***	0.00498***	0.00520***	0.00536***	0.00373***	0.00356**	0.00353**	0.00332**	0.00354**
	(0.00119)	(0.00118)	(0.00120)	(0.00119)	(0.00120)	(0.00140)	(0.00139)	(0.00140)	(0.00139)	(0.00139)
LTD/Assets		0.609***					0.592***			
		(0.168)					(0.167)			
LTD/Assets × Real interest rate		0.00436*					0.00422*			
		(0.00237)					(0.00228)			
STT_ratio			-0.685***					-0.678***		
			(0.240)					(0.238)		
SFI/Sales				-0.237					-0.313	
				(0.297)					(0.302)	
Working capital					-0.206**					-0.205**
					(0.0959)					(0.0958)
Working capital × Real interest rate					-0.00469*					-0.00466*
					(0.00269)					(0.00268)
VIX close	0.00151	0.00155	0.00165	0.00238	0.00245*					
	(0.00167)	(0.00167)	(0.00164)	(0.00165)	(0.00163)					
FX volatility						0.00600***	0.00602***	0.00646***	0.00747***	0.00705***
						(0.00206)	(0.00206)	(0.00201)	(0.00199)	(0.00199)
Observations	2926	2926	2926	2926	2926	2926	2926	2926	2926	2926
R-squared	0.100	0.098	0.098	0.090	0.091	0.102	0.100	0.101	0.093	0.093
Number of ID	266	266	266	266	266	266	266	266	266	266

Table 6: Regression Results for the Post 2020 Period

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post2020	-0.236***	-0.00359	-0.134***	-0.0750**	-0.0644**	-0.161**	0.0623***	-0.0618	-0.0112	-0.0288
	(0.0746)	(0.0287)	(0.0463)	(0.0315)	(0.0320)	(0.0723)	(0.0230)	(0.0389)	(0.0271)	(0.0317)
Leverage	-0.267***	-0.431***	-0.247***	-0.227***		-0.289***	-0.449***	-0.271***	-0.250***	
	(0.0811)	(0.117)	(0.0751)	(0.0741)		(0.0789)	(0.115)	(0.0728)	(0.0729)	
STD_ratio	-0.436***					-0.424***				
	(0.109)					(0.111)				
STD × Post2020	0.241***					0.232***				
	(0.0800)					(0.0804)				
LTD/Assets		0.608***					0.596***			
		(0.155)					(0.156)			
LTD/Assets × Post2020		-0.285***					-0.277***			
		(0.0759)					(0.0757)			
STT_ratio			-0.563***					-0.552***		
			(0.168)					(0.167)		
STT_ratio × Post2020			0.244***					0.227***		
			(0.0828)					(0.0815)		
SFI/Sales				0.0514					0.174	
				(0.338)					(0.355)	
SFI/Sales × Post2020				0.208**					0.186*	
				(0.102)					(0.0997)	
Working capital					-0.0447					-0.107
					(0.113)					(0.119)
Working capital × Post2020					0.0337					0.0798
					(0.0938)					(0.0979)
VIX close	0.00547***	0.00535***	0.00540***	0.00517***	0.00581***					
	(0.00174)	(0.00175)	(0.00180)	(0.00160)	(0.00171)					
FX Vol						0.00203	0.00184	0.00240	0.00278	0.0181***
						(0.00205)	(0.00205)	(0.00204)	(0.00205)	(0.00251)
ln(Industry size)	0.110***	0.110***	0.113***	0.109***	0.101***	0.0820***	0.0831***	0.0839***	0.0809***	
	(0.0133)	(0.0136)	(0.0138)	(0.0135)	(0.0132)	(0.0126)	(0.0130)	(0.0129)	(0.0135)	
World GDP growth	0.00331***	0.00325***	0.00320***	0.00310***	0.00346***	0.00269**	0.00268**	0.00252**	0.00228*	-0.00648***
	(0.00114)	(0.00115)	(0.00116)	(0.00112)	(0.00113)	(0.00119)	(0.00119)	(0.00122)	(0.00118)	(0.00128)
Observations	3,724	3,724	3,724	3,724	3,724	3,724	3,724	3,724	3,724	3,724
R-squared	0.075	0.076	0.073	0.067	0.062	0.072	0.073	0.070	0.064	0.061
Number of panel_id	266	266	266	266	266	266	266	266	266	266

4 Conclusion

Our study examines the relationship between financial constraints, monetary policy, and investment behavior at the industry level in Turkey, with a particular focus on the post-2020 period of unconventional monetary policy. Our findings confirm that financial constraints, particularly leverage and debt composition, play a crucial role in shaping investment decisions. Industries with higher short-term debt reliance and working capital needs face greater investment limitations, whereas those with long-term financing benefit from greater flexibility. Additionally, the interaction between monetary policy and financial structure highlights heterogeneity of industry responses to monetary policy.

The post-2020 period, characterized by expansionary monetary policy despite rising inflation and heightened risk premiums, reveals a shift in investment dynamics. While firms relying on short-term financing became less constrained—potentially due to liquidity injections—industries with high long-term debt exposure saw a decline in investment sensitivity, reflecting increased uncertainty and a shift toward deleveraging. These findings suggest that in a high-risk environment, expansionary monetary policy may create inefficiencies by distorting credit allocation toward riskier firms rather than fostering productive investment.

Governments in emerging markets often face multiple, conflicting objectives and sometimes prioritize policies that maximize short-term benefits of the their electorates. Firms reliant on domestic borrowing, such as many SMEs, initially benefit from low interest rates, even when they are inflationary, as they prioritize reduced borrowing costs over the risks posed by inflation. However, these perceived benefits are often short-lived as rising input costs, wage pressures, and financing constraints associated with unanchored inflation erode these gains, leaving SMEs highly vulnerable. In contrast, larger, financially integrated firms are sensitive to macroeconomic stability and global competitiveness and they are less tolerant of inflationary pressures and prefer stable financial conditions. This divergence in firm preferences underscores the political economy dynamics of monetary policy in emerging markets, where the uneven impact of monetary easing creates pressures on the government to prioritize short-term relief for financially constrained firms. The post-2020 experiment was a result of such a pressure, aiming to improve the performance of small firms by maintaining artificially low interest rates. However, such policies have significant long-term side effects in addition to short-term macroeconomic instability, as they crowd out large and stable firms from the credit markets, weaken the long-term investment environment, and ultimately harming long-run economic growth.

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