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Loan Spreads over the Credit Cycle

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Abstract

This paper investigates the firm heterogeneity in the evolution of loan spreads over the credit cycle in Türkiye. Using the combination of credit registry and administrative datasets, our bank-firm level analysis shows that small- and medium-sized enterprises (SMEs) and firms that are riskier and more prone to financial frictions pay higher loan interest rates. The results also reveal that loan spreads of these firms decrease and converge to the spreads of large and financially sound firms during expansion periods. Our firm-level analysis indicates that these findings persist at the firm level. Our results suggest that SME loan spreads rise more than those of larger firms during tightening periods. This reveals the asymmetric deterioration in SMEs' lending conditions relative to large firms. On the other hand, the significant role of firm riskiness on loan spreads weakens during expansion periods. However, these findings are valid only for loans extended by private banks but not state-owned banks. Our findings lend support to policy makers' prudent approaches over the credit cycle.

Keywords: *Loan Spreads, Credit Cycle, SMEs, State-Owned Banks*

JEL classifications: *E32; E5; G21*

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Non-Technical Summary

Firm external financing is made up of multiple components, such as bank lending, debt securities, and equity issuance. However, only a small proportion of large firms have access to stock and bond markets. On the other hand, small firms mainly depend on bank lending as the primary source of external finance (Beck et al., 2008; Kashyap et al., 1993). Bank lending-driven external financing is even more prevalent for emerging economies, where the majority of economic activity is driven by small- and medium-sized enterprises (SMEs). Hence, it is essential to examine firms' access to bank funding and the cost of their loans in emerging economies.

In this study, we first explore the firm-specific characteristics that drive loan spreads of non-financial firms in Türkiye, which is a large and bank-based emerging economy. Second but more importantly, we examine whether the significance of these firm-specific characteristics varies over the credit cycle. More specifically, we analyze the evolution of loan spreads charged on SMEs and the firms that are more prone to financial frictions during the expansion periods, in comparison with large and financially sound firms. While doing so, we also analyze whether the evolution of loan spreads differs between privately owned and state-owned banks. In other words, we investigate whether loan spreads over the credit cycle evolve heterogeneously across firms and whether private and state-owned banks play different roles.

We document that firms that are riskier and more prone to financial frictions pay higher premiums on bank loans. More specifically, smaller, more levered, illiquid firms and firms with shorter-term debt maturity structure face relatively higher loan spreads, whereas firms that exhibit higher profitability, higher growth, and higher collateral value obtain cheaper bank loans.

We also show that loan spreads of firms that are riskier and more prone to financial frictions converge with the spreads of large and financially sound firms during the expansion periods. On the other hand, SME loan spreads rise more relative to those of large firms during credit tightening periods. However, this is the case for loans extended by private banks but not state-owned banks. These results persist at the firm level. The significant role of firm riskiness on loan spreads weakens for the firms that have an existing relationship with private banks. Our findings suggest that private banks may reduce screening and tend to loosen credit conditions to ex-ante riskier borrowers during expansion periods in line with the risk-taking channel. While quantifying the detrimental impact of this channel on financial stability remains unclear, our findings lend support to policymakers taking a prudent approach over the credit cycle.

1. Introduction

Firm external financing comprises multiple components, such as bank lending, debt securities, and equity issuance. However, only a narrow proportion of large firms have access to stock and bond markets. As a consequence, small firms mainly depend on bank lending as the primary source of external finance (Beck et al., 2008; Kashyap et al., 1993). Bank lending-driven external financing is even more prevalent for emerging economies, where the majority of economic activity is driven by small- and medium-sized enterprises (SMEs).[1] Hence, it is essential to examine firms' access to bank funding and the cost of their loans in emerging economies.[2]

Optimal contract terms charge a premium that covers agency costs stemming from asymmetric information between borrower firms and potential lenders. Therefore, external finance is more costly than internal finance under optimal contracting unless the external finance is fully collateralized, and this premium on external finance is inversely related to the borrower's net worth (Bernanke & Gertler, 1989, 1995; Bernanke et al., 1996). Banks have a critical role in mitigating the impact of this information asymmetry in bank loans by utilizing screening and contracting activities (Bhattacharya & Thakor, 1993; Diamond, 1984, 1991; Ramakrishnan & Thakor, 1984). Banks first screen financial conditions, managerial capabilities, industrial risks, and the track record of firms to gain insight into the loan applicants' soundness and ability to fulfill their future payments. Once they decide to grant loans, banks can also use non-price terms and conditions, such as loan size and collateral requirements, to minimize their credit risk. However, neither screening nor non-price contracting components entirely eliminate information problems and credit risk of bank lending. Hence, banks also price credit risk by charging higher loan spreads on borrowers (Strahan, 1999).

In this study, we first explore the firm-specific characteristics that drive loan spreads of non-financial firms in Türkiye, which is a large and bank-based emerging economy. Second but more importantly, we examine whether the significance of these firm-specific characteristics varies over the credit cycle. More specifically, we analyze the evolution of loan spreads charged on SMEs and the firms that are more prone to financial frictions (more levered, illiquid, etc.) during the expansion periods, in comparison with large and financially sound firms. While

[1] According to the Financial Stability Board database, the average share of banks' financial assets in total financial assets is 60% for emerging countries as of 2022.

[2] Prior literature documents that credit constraints on small firms and credit concentration around large firms can lead to an obstacle to potential growth and efficiency gains in emerging economies (Bartelsman et al., 2013; Beck & Demirgüç-Kunt, 2006; Beck et al., 2008).

doing so, we also analyze whether the evolution of loan spreads differs between privately owned and state-owned banks. In other words, we investigate whether loan spreads over the credit cycle evolve heterogeneously across firms and private and state-owned banks play different roles.[3]

Ruckes (2004) and Dell'Ariccia and Marquez (2006) theoretically display that banks may reduce their screening activities and execute price competition during expansion periods. Consequently, they may extend credit with weaker conditions to uncreditworthy borrowers. In this regard, several studies empirically analyze the evolution of lending standards during monetary policy easing and boom periods of credit or business cycles. In general, these studies show that the firms that are riskier and more prone to financial frictions access relatively higher volume of loans and/or face relatively looser credit conditions during periods of monetary expansion (Caglio et al., 2021; Chen et al., 2022; Ioannidou et al., 2015; Jiménez et al., 2014; Paligorova & Santos, 2017). Jiménez, Benito, and Vegas (2018) document that Spanish banks soften their lending standards during the boom periods of the business cycle by showing the probability of granting loans increases for ex-ante riskier and unproductive firms during these periods. Focusing on the credit cycle, Bedayo et al. (2020) show that Spanish banks reduce their screening time for riskier borrowers, whereas Dell'Ariccia et al. (2012) find that lenders placed less emphasis on borrowers' repayment capacity and lowered denial rates during the credit boom in the US. Similarly, Rodano et al. (2018) analyze the lending standards over the credit cycle in Italy and show that substandard firms are excluded from credit access in the bust period of the credit cycle.[4]

However, the empirical literature on the heterogeneous evolution of lending standards across borrowers over the business or credit cycle is relatively limited and mostly focuses on developed economies. One of the major reasons for this scarcity is the lack of granular datasets required to implement a rigorous bank-firm level analysis, especially for emerging countries. We contribute to this limited literature on emerging markets by utilizing a confidential dataset

[3] Since Türkiye has a bank-based financial system, it is important to examine loan spreads for external financing costs of non-financial firms. The average bank credit-to-GDP ratio in Türkiye is 59.6%, and the average private sector bank credit-to-stock market capitalization ratio is 255% over our sample period 2011-2022 (Source: World Bank Database). Moreover, bank credit accounts for 90.5% of the total financial debt of non-financial firms in Türkiye on average over our sample period 2011-2022 (Source: CBRT real sector company accounts statistics). Banks also hold a significant share of the assets in Türkiye's entire financial sector. The average share of banks' financial assets in total financial assets in Turkish economy is 83.7% for the period between 2011 and 2022, while this share is 65.5%, on average for emerging countries (Source: Financial Stability Board Database).

[4] Bedayo et al. (2020) use the European volatility index (VSTOXX) to proxy credit booms in Spain, where a lower level of volatility index implies boom periods, whereas Dell'Ariccia et al. (2012) address the US subprime mortgage boom by focusing on the areas that experienced faster credit growth. Rodano et al. (2018) define the period 2004-2007 as the boom phase, the 2008-2009 period as the bust/crisis phase, and the 2010-2011 period as the recovery phase of the credit cycle in Italy.

that includes bank-firm level credit registry data and firm-level financial statements covering the universe of all incorporated firms in Türkiye. This unique and comprehensive dataset, which is one of the novel aspects of this paper, allows us to examine the heterogeneities of loan spreads across firms over the credit cycle in detail.

Examining the firm heterogeneity in the evolution of loan spreads, it is essential to absorb supply-side variation since the evolution of loan spreads can also be driven by the heterogeneity in banks' balance-sheet strength.[5] To do so, prior studies use bank-time fixed effects where identification comes from the variation across firms that obtain credit from the same bank within the same period (Bedayo et al., 2020; Caglio et al., 2021; Jiménez et al., 2018). We employ a more saturated alternative of fixed effects in our bank-firm-year level regression analyses. Banks' specialization in a specific sector can improve the credit access and contract terms of firms from that particular sector because the banks may be able to gather more sector-specific information and hence they may be exposed to less information asymmetry in the sectors they specialized in (De Jonghe et al., 2020; Di & Pattison, 2020; Giometti & Pietrosanti, 2022). De Jonghe et al. (2020) also show that banks prefer to transmit negative funding shocks less to the firms from the sectors they specialize in. Thus, we utilize bank-sector-time to isolate the link between firm characteristics and loan spreads. This enables us to exploit the variation in the loan spreads extended by the same bank to the different firms operating in the same sector within the same year. Likewise, we additionally control for the effects of banks' differing perceptions of industrial risks and their sectoral specialization on loan spreads. We further include bank-firm fixed effects to control for lending relationships. As such, we ensure that our results are not driven by the compositional changes in the pool of borrowers and lenders over the credit cycle (Altavilla et al., 2020; Paligorova & Santos, 2017).[6]

Our study also contributes to the literature that examines the cyclicality of lending according to the ownership structure of banks. While most of the relevant studies show that lending by state-owned banks is less procyclical or even counter-cyclical (Behr et al., 2017; Bertay et al., 2015; Brei & Schclarek, 2013; Chen et al., 2016; Coleman & Feler, 2015; Cull & Peria, 2013; Fungáčová et al., 2013; Léon, 2023), there are also few studies that report there is no lending

[5] The literature on the bank lending channel claims that financial shocks propagate to the real economy via the banks' credit supply channel, by exploiting heterogeneity across banks and their differing effects on credit supply and lending standards (Dwarkasing et al., 2016; Jiménez et al., 2020). In this regard, several studies showed that bank balance-sheet characteristics are important factors that affect the transmission of monetary policy and financial shocks on credit supply growth and lending standards (Ehrmann et al., 2003; Jiménez et al., 2012, 2020; Kashyap & Stein, 1995, 2000; Kishan & Opieala, 2000).

[6] For the importance of lending relationships in the context of credit supply and credit conditions, see Berger and Udell (1995), Bharath et al. (2011), Boot (2000), Cotugno et al. (2013), and Degryse and Ongena (2005).

difference between state-owned and private banks (Dekle & Lee, 2015; Zins & Weill, 2018).[7] However, these studies implement bank level empirical settings using bank financial statements as their data source; hence, they cannot examine the firm heterogeneity. Thanks to our granular data, we are able to examine firm heterogeneity in the evolution of loan spreads in terms of the ownership structure of banks and investigate whether private and state-owned banks play different roles over the credit cycle.

We first examine the firm-specific determinants of loan spreads. Our results suggest that firms that are riskier and more prone to financial frictions pay higher premiums on bank loans. More specifically, smaller, more levered, illiquid firms and firms with shorter-term debt maturity structure face relatively higher loan spreads, whereas firms that exhibit higher profitability, higher growth, and higher collateral value obtain cheaper bank loans.

We next examine how the role of firm heterogeneity in loan spreads evolves over the credit cycle. The results show that loan spreads charged by private banks on the firms that are riskier and more prone to financial frictions converge with the spreads of financially sound firms during the periods of credit expansion. The results also show that loan spreads of SMEs are more responsive to the credit cycle than large firms, in line with the prior arguments in the literature (Bernanke & Gertler, 1989; Bernanke et al., 1996; Caglio et al., 2021). There are two potential channels leading to this finding. First, the expansionary phase of the credit cycle can improve firms' net worth and reduce the agency cost of lending more for small and/or riskier firms; hence, credit expansions may improve the credit terms relatively more for these firms (Bernanke & Gertler, 1989; Bernanke et al., 1996). The second channel could be a supply-side driven channel. Banks can perceive loans to be less risky during the expansionary periods compared to tightening phases, and they may tend to loosen credit conditions to ex-ante riskier borrowers in these periods, i.e., the risk-taking channel (Ioannidou et al., 2015; Jiménez et al., 2014; Paligorova & Santos, 2017).

We next examine whether the ownership structure of banks matters. The results show that the cyclicality of loan spreads based on firm heterogeneity is valid only for private banks but not for state-owned banks. This suggests that lending by state-owned banks can be less procyclical, corroborating Behr et al. (2017), Bertay et al. (2015), Coleman and Feler (2015), and Fungáčová et al. (2013). We further investigate whether our results persist at the firm level. In line with

[7] Brei and Schclarek (2013), Dekle and Lee (2015), Chen et al. (2016), and Bertay et al. (2015) conduct worldwide cross-country studies; Zins and Will (2018), and Léon (2023) study African countries, while Cull and Peria (2013) study Latin American and Eastern European countries. On the other hand, Fungáčová et al. (2013), Coleman and Feler (2015), and Behr et al. (2017) implement single-country settings for Russia, Brazil, and Germany, respectively.

our bank-firm level findings, our firm level analyses show that loan spreads of smaller and riskier firms that have a lending relationship with private banks converge to the loan spreads of larger and financially sound firms during credit expansions. However, the loan spreads of the firms that work only with state-owned banks do not display cyclicality with respect to firm characteristics.

The remainder of this paper is structured as follows. In Section 2, we present the datasets used in the paper. Section 3 elaborates on our research design and empirical settings. Section 4 reports our bank-firm and firm level results and discusses the findings. Section 5 concludes our study.

2. Data

Our primary data source is the confidential Credit Registry data provided by the Central Bank of the Republic of Türkiye (CBRT). The Credit Registry is made up of bank-firm level data that contains the universe of all loan agreements between borrowers and banks, including information on principal amount, issuance date, interest rate, etc. In this study, we focus on the local currency-denominated corporate loans granted by the commercial banks, and in our sample, we have 25 privately owned and three state-owned commercial banks operating in Türkiye over the period 2011-2022.[8] While state-owned banks are fewer in number, they have a significant share in the Turkish banking sector. Three of the largest four banks in the sector are state-owned commercial banks, and these banks represent 34.7% of all credit on average over the sample period.

We also use financial statements collected by the Revenue Administration of Türkiye to obtain firm-specific characteristics. This dataset includes annual balance sheets and income statements for the universe of all incorporated firms in Türkiye.[9] We exclude firms with incomplete or incoherent information from the sample, such as firms with negative total assets and negative gross sales. To build the final sample for our bank-firm level analyses, we merge the datasets derived from the Credit Registry and Revenue Administration datasets using unique tax identity numbers of firms. To mitigate the possible effects of outliers, we also winsorize all continuous variables at the 1st percentile in each tail. Our matched dataset covers 70% of all TL-denominated flow corporate loans granted in Türkiye over the period 2011-2022.

[8] The possible bias introduced by FX-debt holding firms is discussed in Section 4.5.

[9] This dataset does not include unincorporated businesses such as sole-proprietorship and partnership businesses. The vast majority of these are micro firms that are not obliged to report regular balance sheets. Our dataset including incorporated firms accounts for, on average, 90% of total sales of all firms over the sample period.

3. Research Design

3.1 Firm-Specific Determinants of Loan Spreads

We first explore the firm-specific determinants of loan spreads by estimating fixed effect regressions specified in Eq. (1):

$$SPREAD_{b,f,t} = \beta_0 + \beta_1 SME_{f,t} + \beta_2 LEVERAGE_{f,t-1} + \beta_3 LIQUIDITY_{f,t-1} + \beta_4 ST_DEBT_RATIO_{f,t-1} + \beta_5 TANGIBILITY_{f,t-1} + \beta_6 PROFITABILITY_{f,t-1} + \beta_7 GROWTH_{f,t-1} + (\gamma_b \, x \, \phi_s \, x \, \rho_t) + (\gamma_b \, x \, \alpha_f) + \varepsilon_{b,f,t} \qquad (1)$$

In Eq. (1), our dependent variable is the loan spread that proxies the cost of borrowing for firms, $SPREAD$. Constructing loan spreads, we first derive the monthly weighted average interest rate by weighting the interest rate of each loan granted by bank b to firm f in that month by their principal amount. We then generate our monthly spreads over a benchmark interest rate for banks, which is the monthly weighted average cost of the CBRT funding.[10] The dispersion of loan spreads can differ across months due to financial developments or monetary policy stance (Baziki et al., 2022; Ivashina & Scharfstein, 2010), and dispersion differing across months may cause a bias in examining the loan spreads in an annual panel regression analysis. To deal with this concern, we standardize loan spreads on a monthly basis by their monthly sample mean and standard deviation. Lastly, we annualize standardized monthly spreads, weighting them by the total loan granted in each month of that particular year, and finalize our spread measure at bank-firm-year level, $SPREAD$.

To shed light on the firm level determinants of loan spreads, we employ a set of explanatory variables that are used by the prior studies in the literature to proxy firms' riskiness and their exposure to financial frictions. We first use the SME dummy as one of the explanatory variables. Since larger firms are generally well-established and more diversified across customers, suppliers, and regions, they are assumed to be less exposed to financial and operational risks (Graham, 2008; Santos, 2011). Also, lending to SMEs is perceived to be riskier because of SMEs' lack of ability to provide collateral and their informational opaqueness. Therefore, larger firms are expected to access external finance with more favorable conditions. The *SME* dummy takes the value of 1 for firms with less than 250 employees and 0 otherwise. Alternatively, we define micro-, small-, and medium-sized firms as firms with less than 10

[10] The weighted average cost of the CBRT funding is the weighted average of interest rates of all funding instruments (repo, depo, late liquidity window facilities, etc.) implemented in a particular period, according to the total amount of funding made by each instrument.

employees, firms with more than 9 but less than 50 employees, and firms with more than 49 but less than 250 employees, respectively. Second, we include firm leverage that is used as a financial friction measure and assumed to be a good proxy for default risk by the prior studies (Caglio et al., 2021; Anderson & Cesa-Bianchi, 2024; Ottonello & Winberry, 2020). Firms with higher leverage, ceteris paribus, face a greater probability of default; hence, the highly levered firms are expected to be charged with higher loan spreads. We define $LEVERAGE$ as total financial debt divided by total assets. Third, we take the liquidity conditions of firms into account. Liquid assets are less likely to lose value in downturn periods; therefore, firms with higher liquidity are expected to have fewer problems fulfilling their periodical financial obligations and debt payments. Thus, firms with higher liquid assets are expected to access loans with more favorable conditions (Strahan, 1999). $LIQUIDITY$ is calculated as the sum of cash and cash equivalents divided by total assets.

Fourth, a shorter-term debt maturity structure increases the likelihood of refinancing and exposes firms to higher rollover risk, which is positively associated with higher expected default probability and credit risk (Gopalan et al., 2014; He & Xiong, 2012; Wang et al., 2017). We define short-term debt structure, ST_DEBT_RATIO, as the ratio of short-term debt to total debt, and expect it to have an upward effect on loan spreads. Fifth, a higher share of tangible fixed assets is expected to reduce firms' opaqueness and improve their lending standards since tangible assets may serve as collateral in loan contracts and their value depreciates less in case of default compared to intangible assets, (Cenni et al., 2015; Graham et al., 2015; Strahan, 1999). Therefore, there should be a negative relation between the share of tangible assets and loan spreads. We measure $TANGIBILITY$ as the total of net plant, property, and equipment divided by total assets. Sixth, higher profitability assists firms in generating higher cash flows; hence, it strengthens the capacity of firms to service their debt and reduces credit risk (Drakos, 2013; Wang et al., 2020; Yarba & Güner, 2020). We expect higher profitability to bring lower loan spreads. $PROFITABILITY$ is defined as the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Seventh, we investigate the relation between firms' growth performance and their loan spreads. Since faster firm growth may encourage more agency problems and risk taking for firms (Bauwhede et al., 2015), and growth opportunities are more vulnerable to financial distress (Santos, 2011; Yarba, 2023; Yarba & Deniz, 2024), faster firm growth may have a positive effect on credit risk. However, since we also control for other firm characteristics that are likely to be related to agency problems and risk-taking tendencies of firms, such as $LEVERAGE$, $TANGIBILITY$, and ST_DEBT_RATIO,

faster firm growth could also reflect the managerial and operational abilities of firms and potential gains can be obtained from future growth (Santos, 2011). Therefore, faster firm growth could improve firms' credit quality and negatively impact their loan spreads. $GROWTH$ is defined as the logarithmic difference of inflation-adjusted annual net sales. Table 1 reports the descriptive statistics of the variables used in this study.

We also include bank-sector-time fixed effects and bank-firm fixed effects in our analyses. The use of fixed effects is detailed in Section 3.2. To mitigate the possible endogeneity concerns resulting from the potential reverse causality, we lag all continuous explanatory variables derived from financial statements by one year in all regressions throughout the study.

Table 1. Descriptive Statistics

	Observations	Mean	Standard Deviation	p10	p25	Median	p75	p90
SPREAD	2,237,206	-0.222	0.558	-0.823	-0.557	-0.283	0.064	0.455
SME	2,237,206	0.965	0.183	1.000	1.000	1.000	1.000	1.000
MICRO	2,237,206	0.382	0.486	0.000	0.000	0.000	1.000	1.000
SMALL	2,237,206	0.432	0.495	0.000	0.000	0.000	1.000	1.000
MEDIUM	2,237,206	0.151	0.358	0.000	0.000	0.000	0.000	1.000
LEVERAGE	2,237,206	0.311	0.219	0.027	0.131	0.290	0.461	0.614
LIQUIDITY	2,237,206	0.088	0.160	0.001	0.007	0.038	0.138	0.298
TANGIBILITY	2,237,206	0.208	0.202	0.019	0.056	0.141	0.296	0.507
PROFITABILITY	2,237,206	0.073	0.102	0.005	0.027	0.062	0.109	0.177
ST_DEBT RATIO	2,237,206	0.786	0.256	0.382	0.641	0.890	1.000	1.000
GROWTH	2,237,206	0.110	0.649	-0.434	-0.129	0.080	0.315	0.673

SPREAD is our dependent variable that proxies standardized loan spreads at bank-firm level, which is defined in Section 3.1. *SME* takes the value 1 if the employment of the firm is less than 250, 0 otherwise. Alternatively, *MICRO* takes the value 1 if employment is less than 10, 0 otherwise; *SMALL* takes the value 1 if employment is more than 9 but less than 50, 0 otherwise; and *MEDIUM* takes the value 1 if employment is more than 49 but less than 250, 0 otherwise. *LEVERAGE* is total financial debt divided by total assets. *LIQUIDITY* is the sum of cash and cash equivalents divided by total assets. *TANGIBILITY* is the total of net plant, property, and equipment divided by total assets. *PROFITABILITY* is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. *ST DEBT RATIO* is the ratio of short-term debt to total debt and GROWTH is the logarithmic difference of inflation-adjusted annual net sales.

3.2 Evolution of Loan Spreads over the Credit Cycle

In this section, we examine whether the role of firm-specific characteristics on loan spreads changes over the credit cycle. Specifically, we investigate whether the loan spreads charged on the firms that are more prone to financial frictions converge to the loan spreads of financially sound firms during credit expansions. To examine the credit cycle, many studies use the credit-to-GDP ratio and define it as a powerful indicator of banking distress and financial crises (Aikman et al., 2015; Demirgüç-Kunt & Detragiache, 1998; Gourinchas et al., 2001; Schularick & Taylor, 2012). Aikman et al. (2015) and Gourinchas et al. (2001) proxy lending booms with growth/deviations in the nominal credit level to nominal GDP ratio, whereas Demirgüç-Kunt and Detragiache (1998), and Schularick and Taylor (2012) also use real growth of bank loans along with the credit-to-GDP ratio to examine lending booms. We measure the credit cycle with the inflation- and exchange rate-adjusted annual loan usage to real GDP ratio (real credit-to-real GDP ratio). Considering inflation and exchange rate movements during the period of 2011-2022 in Türkiye, it is important to adjust the nominal change in the credit stock for inflation and the exchange rate. Using the real credit-to-real GDP ratio enables us to detect the periods of credit expansion by normalizing the flow credit usage with the real economic activity, which is expected to be associated with the overall demand conditions in that particular year.[11]

To analyze the firm heterogeneity in the evolution of loan spreads and, to test the convergence of loan spreads across firms during the periods of credit expansions, we estimate the regression specified in Eq. (2).

$$SPREAD_{b,f,t} = \beta + \Gamma SME_{f,t}\ x\ EXPANSION_t + \Theta BS\ CHARACTERISTICS_{f,t-1}\ x\ EXPANSION_t + \Pi SME_{f,t} + \Omega BS\ CHARACTERISTICS_{f,t-1} + (\gamma_b\ x\ \phi_s\ x\ \rho_t) + (\gamma_b\ x\ \alpha_f) + \varepsilon_{b,f,t} \quad (\mathbf{2})$$

We include the $EXPANSION$ dummy for the expansion periods of the credit cycle, which takes the value of 1 for the years above the mean of real credit-to-real GDP ratio, 0 otherwise.[12] We then include the interaction variables of the $EXPANSION$ dummy and the firm characteristics described in Section 3.1 in our model to test whether the loan spreads of SMEs and the firms that are more prone to financing constraints converge to the spreads of large and financially sound firms during the expansion periods of the credit cycle.[13] In Eq. (2), the

[11] According to Schularick and Taylor (2012), excessive risk-taking and moral hazard problems can become more severe in cases where the financial sector grows relative to the size of the economy, which is proxied by the credit-to-GDP ratio.
[12] When the median value is taken as the threshold, the expansion periods remain the same.
[13] The reason we do not singlehandedly include the *EXPANSION* dummy in Eq. (2) is that it is already absorbed by bank-sector-time fixed effects.

$BS\ CHARACTERISTICS$ vector includes the explanatory variables, such as $LEVERAGE$, $LIQUIDITY$, ST_DEBT_RATIO, $TANGIBILITY$, $PROFITABILITY$, and $GROWTH$ defined in Section 3.1.

Additionally, we include bank-sector-time fixed effects to absorb bank side variation and isolate the relationship between loan spreads and firms' balance sheet strength over the credit cycle. In the specifications with bank-sector-time fixed effects, the identification comes from the variation in the loan spreads charged by the same bank within the same year to different firms that operate in the same sector (NACE Rev. 2). Thus, we control not only for the bank-lending channel where the heterogeneity in banks' balance sheet strength drives the lending standards over the cycle, but also for banks' differing industrial risk perception and their sectoral specialization, which are shown to have an impact on lending standards (De Jonghe et al., 2020; Di & Pattison, 2020; Giometti & Pietrosanti, 2022). Moreover, bank-sector-time fixed effects also control time-varying sectoral heterogeneity on the demand side.

We further include bank-firm fixed effects to control for lending relationships. A bank-firm lending relationship can arise as a result of non-random matching. Banks with differing risk appetites may be particularly matched with firms that have specific characteristics (e.g., riskiness or creditworthiness). Also, a bank's assessment of the riskiness/creditworthiness of a firm may persistently differ from another bank's due to the private information gained in an ongoing lending relationship (Altavilla et al., 2020). Therefore, the lending standards faced by firms may differ due to an existing bank-firm relationship. With the use of bank-firm fixed effects, the variation in the loan spreads comes from the differences in loan pricing of the same bank on the same firm across different phases of the credit cycle. Therefore, bank-firm fixed effects enable us to control those unobserved factors by exploiting time variation in loan spreads within a bank-firm relationship.

4. Results

4.1 Determinants of Loan Spreads

Table 2 presents the estimations of the empirical model in Eq. (1). The first two columns report the full sample results. Columns 3-4 report the results for the sample of private banks, while Columns 5-6 report the results for state-owned banks. In Column 2, Column 4, and Column 6, we replace the SME dummy with its subgroups, $MICRO$, $SMALL$, and $MEDIUM$. All columns presented in Table 2 include bank-firm and bank-sector-time fixed effects and they are estimated with robust standard errors clustered at bank-time level. Table 2 shows that all firm

level explanatory variables that are used as the measures for financial friction and/or a proxy of credit risk have statistically significant relationships with loan spreads for the full sample and private banks sample (Columns 1 – 4). These results confirm the importance of firms' balance-sheet strength on loan pricing, consistent with our expectations and the findings suggested by prior studies in the literature.

Table 2. Determinants of Loan Spreads

	Full Sample		Private Banks		State-Owned Banks	
	1	2	3	4	5	6
	SPREAD	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*
SME	0.029***		0.040***		0.004	
	(0.007)		(0.008)		(0.010)	
MICRO		0.143***		0.172***		0.079***
		(0.014)		(0.015)		(0.024)
SMALL		0.078***		0.096***		0.035**
		(0.010)		(0.011)		(0.017)
MEDIUM		0.025***		0.034***		0.001
		(0.006)		(0.008)		(0.009)
LEVERAGE	0.053***	0.054***	0.058***	0.060***	0.043***	0.043***
	(0.006)	(0.006)	(0.008)	(0.008)	(0.007)	(0.007)
LIQUIDITY	-0.051***	-0.051***	-0.060***	-0.059***	-0.031***	-0.031***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)
TANGIBILITY	-0.039***	-0.036***	-0.040***	-0.036***	-0.037***	-0.034***
	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)	(0.007)
PROFITABILITY	-0.079***	-0.074***	-0.083***	-0.077***	-0.069***	-0.065***
	(0.008)	(0.008)	(0.010)	(0.009)	(0.014)	(0.013)
ST DEBT RATIO	0.010***	0.009***	0.011***	0.010**	0.007**	0.007**
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)
GROWTH	-0.011***	-0.010***	-0.012***	-0.010***	-0.010***	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Bank-Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,237,206	2,237,206	1,529,475	1,529,475	707,731	707,731
R-squared	0.672	0.673	0.603	0.604	0.662	0.663

This table reports the coefficient estimates of the regressions in Eq. (1) for bank-firm pairs over the period 2011-2022. All variables are defined in Section 3.1. All regressions reported in Table 2 include bank-firm and bank-sector-time fixed effects, where sectors are defined at two-digit sector codes (NACE Rev. 2) based on the economic activity classification released by EUROSTAT. Standard errors are clustered at bank-time level. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

First, SMEs are charged higher loan spreads than large firms, and the magnitude of extra premium on loan spreads relative to large firms follows the order of micro-, small-, and medium-sized firms. [14] This result supports the arguments that small firms face tighter lending standards and financing obstacles due to their informational opaqueness, which leads to higher agency costs stemming from asymmetric information problems (Beck et al., 2006; Bernanke & Gertler, 1989, 1995). Also, large firms are generally less exposed to financial and operational

[14] Alternatively, using the logarithm of total employees as a measure of firm size does not alter our results. For brevity, they are not reported but they are available upon request.

risks because they are expected to be well-established and better diversified across customers, suppliers, and regions. Second, firms with higher leverage pay higher interest rates on bank loans, in line with the expectations that a higher level of firm leverage is associated with a greater likelihood of future insolvency (Caglio et al., 2021; Santos & Winton, 2019). Our results also confirm that the maturity structure of firms' debt stock is also important for the cost of bank loans. The upward effect of the short-term debt ratio on loan spreads supports the rollover risk hypothesis. It postulates that shorter-term debt maturity structure may have a negative impact on the borrower's creditworthiness by increasing the likelihood of being exposed to refinancing and causing banks to demand higher risk premiums to compensate for the increased credit risk (Gopalan, 2014; Wang et al., 2020). The negative coefficient of $LIQUIDITY$ indicates firms with a higher share of liquid assets have lower borrowing costs, consistent with the expectation that highly liquid firms are more able to make periodical/short-term payments of their current liabilities. Moreover, firms with a higher share of tangible assets have lower borrowing costs. Asset tangibility, which is employed as a proxy for the ability to provide collaterals (Cenni et al., 2015) also reduces the opaqueness of firms. Thus, it mitigates the agency costs stemming from the asymmetric information problems because tangible assets are easier for financial intermediaries to evaluate, and firms with higher share of tangible assets have more to lose in case of default (Frank & Goyal, 2008; Graham et al., 2015; Strahan, 1999; Yarba & Güner, 2020). The negative coefficient of $PROFITABILITY$ indicates more profitable firms are likely to borrow with better conditions and pay lower loan spreads because they are more capable of generating cash flows and servicing their debt than unprofitable firms (Wang et al., 2020). Lastly, two opposing arguments exist in the literature regarding the expected effect of firm growth on credit quality and, thereby, the cost of debt. The first argument is that faster firm growth is associated with more agency problems, and higher growth opportunities might boost incentives to shift investments toward risky assets for firms (Eisdorfer, 2008; Heyman et al., 2008; Wang et al., 2020). Therefore, faster firm growth may have an upward effect on loan spreads. However, since we also employ other firm characteristics that control for riskiness and vulnerability to financial distress of high-growth firms, such as leverage, debt maturity structure, liquidity conditions, and asset tangibility, faster firm growth could reflect the managerial/operational abilities of firms and signal the value that can be gained from future

growth (Santos, 2011). We find that firms with higher growth access cheaper bank loans, consistent with the latter argument.[15]

We also find similar results for the sample of state-owned banks with those of the sample of private banks for the firm characteristics that proxy being exposed to financial frictions and firm riskiness. Even though the economic significances are lower, state-owned banks also charge higher loan spreads on firms that are more levered, illiquid, and unprofitable, and they charge lower spreads on firms with higher shares of tangible assets and shorter debt maturity structure. Moreover, firms with higher growth opportunities obtain cheaper credit from state-owned banks. Another remarkable difference between the results for the private banks and state-owned banks is that state-owned banks do not differentiate SMEs from large firms in terms of loan spreads (Column 5), unlike private banks (Column 3). Examining the subgroups of SMEs, state-owned banks do not differentiate medium-sized firms from large firms (Column 6), while private banks charge higher loan spreads on all subgroups of SMEs (Column 4). Moreover, the economic significances of the loan spreads charged on micro- and small-sized firms are remarkably lower for the sample of state-owned banks, compared to private banks (Column 4 and Column 6). This finding is likely to stem from the difference in the objective functions of private and state-owned banks.[16] While private banks prioritize maximizing their profit, state-owned banks may aim to maximize broader social benefits by mitigating credit market failures and lending standards of constrained firms (Sapienza, 2004). Therefore, considering the importance of SMEs in the aggregate economy, state-owned banks may tend to charge relatively softer lending conditions on SMEs to boost economic activity and employment.[17]

4.2 Do Loan Spreads Converge across Firms during Credit Expansions?

To examine the firm heterogeneity in the evolution of loan spreads over the expansion periods, we estimate the model specified in Eq. (2). The results for the private bank loans subsample are presented in Column 3 and Column 4 of Table 3. The results in Column 3 suggest that SMEs experience a reduced loan spread by 5.9 basis points (bps) compared to large firms during the expansion periods. The results are not only statistically significant but also economically

[15] In addition to the explanatory variables utilized in our study, we further include firms' ages and the number of banks they work with in our analyses. Our main results remain the same, while these two additional variables do not have robust associations with loan spreads. To conserve space, they are not reported, but they are available upon request.

[16] Although our focus is on the differing dynamics of private and state-owned banks, we also investigated whether the firm heterogeneity in the loan spreads over the credit cycle differs between domestic private banks and foreign private banks in Türkiye. Our results show that there is no statistically significant differentiation between domestic and foreign private banks. These results are not reported for the sake of brevity, but they are available upon request.

[17] According to statistical reports of the Turkish Statistical Institute (TURKSTAT), SMEs constituted 99.7% of the total number of enterprises, 72.1% of total employment, and 46.0% of total turnover in Türkiye over the 2011-2022 period.

significant. The relative reduction in loan spreads of SMEs corresponds to 26.5% of the sample mean and 20.8% of the median $SPREAD$. Among SMEs, small-sized firms benefit the most from credit expansions in terms of loan spreads, while medium-sized firms benefit the least (Column 4). Moreover, examining the firms' balance-sheet characteristics that are employed to proxy their riskiness and potential exposure to financial frictions, the results show that more levered, illiquid, less tangible, unprofitable, and high-growth firms and firms with short-term debt maturity structure benefit relatively more from the credit expansions in terms of loan spreads through private banks (Column 3 and Column 4).

These results suggest that during the expansion periods, loan spreads obtained from private banks by riskier firms and firms more prone to financial frictions converge to the loan spreads of their counterparts with more robust balance-sheet characteristics. In other words, the impact of firm balance-sheet strength on the cost of loans charged by private banks weakens during the expansion periods of the credit cycle. There can be two potential channels leading to this finding. First, the expansionary phase of the credit cycle can improve firms' net worth and reduce the agency cost of lending. Since small and/or risky firms are exposed to financial frictions and agency costs more than large and financially sound firms, the expansionary phase of the credit cycle may improve the credit terms relatively more for small and/or risky firms (Bernanke & Gertler, 1989; Bernanke et al., 1996; Caglio et al., 2021; Ferrando et al., 2019). The second potential channel is a supply-side driven channel where banks' screening and risk-taking approaches affect the lending standards over the credit cycle. Even if we control for time-varying observed and unobserved heterogeneity in the bank side by bank-sector-time fixed effects, the common tendencies of private banks in the periods of credit expansion may still lead to a relative reduction in the loan spreads of SMEs and the firms that are more prone to financial frictions. Banks can lower the intensity of screening activities during the expansion periods due to the decline in the default probabilities of firms. This low screening activity may lead banks to loosen their credit standards to uncreditworthy borrowers in order to undercut their competitors in the lending market (Ruckes, 2004). Also, expansion in the credit market may weaken the information asymmetry across banks and consequently, screening activities become unprofitable and banks may shift away from assessing the creditworthiness of borrowers towards reducing credit standards and granting credit to all borrowers indiscriminately (Dell'Ariccia & Marquez, 2006). Moreover, banks can perceive loans to be less risky during the expansionary periods compared to tightening phases, and they may tend to extend more loans and looser credit conditions to ex-ante riskier borrowers in these periods,

i.e., the risk-taking channel (Ioannidou et al., 2015; Jiménez et al., 2014; Paligorova & Santos, 2017).

Table 3. Evolution of Loan Spreads over the Credit Cycle

	Full Sample		Private Banks		State-Owned Banks	
	1	2	3	4	5	6
	SPREAD	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*
SME x EXPANSION	-0.033		-0.059**		0.027	
	(0.024)		(0.029)		(0.039)	
MICRO x EXPANSION		-0.025		-0.059*		0.051
		(0.030)		(0.035)		(0.055)
SMALL x EXPANSION		-0.040		-0.065**		0.021
		(0.025)		(0.031)		(0.039)
MEDIUM x EXPANSION		-0.026*		-0.043**		0.014
		(0.016)		(0.020)		(0.022)
LEVERAGE x EXPANSION	-0.043***	-0.041***	-0.051***	-0.051***	-0.026	-0.019
	(0.015)	(0.014)	(0.016)	(0.016)	(0.031)	(0.028)
LIQUIDITY x EXPANSION	0.021**	0.021**	0.033***	0.033***	-0.005	-0.005
	(0.009)	(0.009)	(0.011)	(0.011)	(0.016)	(0.016)
TANGIBILITY x EXPANSION	0.012	0.013*	0.021**	0.020**	-0.005	-0.001
	(0.008)	(0.008)	(0.010)	(0.010)	(0.012)	(0.011)
PROFITABILITY x EXPANSION	0.024	0.027	0.042*	0.040**	-0.019	-0.004
	(0.019)	(0.016)	(0.021)	(0.019)	(0.037)	(0.031)
ST DEBT RATIO x EXPANSION	-0.009**	-0.010**	-0.016***	-0.015***	0.004	0.002
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)
GROWTH x EXPANSION	-0.009***	-0.008***	-0.006*	-0.006*	-0.014***	-0.013***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,237,206	2,237,206	1,529,475	1,529,475	707,731	707,731
R-squared	0.672	0.673	0.604	0.605	0.662	0.663

This table reports the coefficient estimates of the regressions in Eq. (2) for bank-firm pairs over the period 2011-2022. All bank-firm level and firm level variables are defined in Section 3.1. *EXPANSION* dummy is defined in Section 3.2. All regressions reported in Table 3 include bank-firm and bank-sector-time fixed effects, where sectors are defined at two-digit sector codes (NACE Rev. 2) based on the economic activity classification released by EUROSTAT. Also, each column singlehandedly includes firm characteristics in the interaction variables. Thus, the row of "Firm Controls" includes size dummies (*SME* or *MICRO*, *SMALL*, *MEDIUM*), *LEVERAGE*, *LIQUIDITY*, *TANGIBILITY*, *PROFITABILITY*, *ST DEBT RATIO*, and *GROWTH*. The coefficient estimates of "Firm Controls" are not reported in Table 3 for the sake of brevity. However, they are parallel with the results reported in Table 2, and they are available in the extended version of Table 3 given in the Appendix (See Table A1). Standard errors are clustered at bank-time level. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

On the other hand, unlike private banks, state-owned banks can prioritize improving social welfare and addressing market failures rather than profit maximization (Sapienza, 2004); hence, they may be willing to loosen lending standards in financial downturns to stabilize credit conditions over the cycle, especially for the firms that are more prone to credit market failures (Behr et al., 2017; Bertay et al., 2015; Chen et al., 2016). To examine these arguments in the literature, we repeat our analysis for the sample of firm-state bank pairs. The results are reported in Column 5 and Column 6 of Table 3. In contrast with the results of the firm-private banks sample, we mostly find no convergence between loan spreads charged by state-owned banks. The coefficients of all interaction variables between the $EXPANSION$ dummy and firm characteristics are statistically insignificant, except $GROWTH$. This finding is likely to arise

from the tendency of state-owned banks to stabilize loan spreads over the credit cycle. In periods of credit contractions, private banks tend to impose relatively tighter lending conditions on SMEs and firms with weaker balance-sheet, i.e., flight to quality (Bernanke & Gertler, 1989, 1995). To mitigate this rising cost of debt on financially constrained firms, state-owned banks may relatively ease the lending conditions for these firms during the periods of credit contractions rather than choosing the path of flight to quality. Therefore, the gap between the periods of credit expansion and contraction in relative loan spreads charged by state-owned banks on financially constrained firms is expected to be narrower.

4.3 Can the Convergence in Loan Spreads of Private Banks be Explained by Loan Demand?

Another potential reason that may lead to a relative reduction in riskier firms' loan spread obtained from private banks might be the relatively lower credit demand of these firms. In our baseline results, we also control for time-varying sectoral heterogeneity on the demand side by including bank-sector-time fixed effects. Paligorova and Santos (2017) claim that if the credit demand is a determinant of the relative reduction in the loan spreads of riskier firms, then the loan amount of these firms would also decline along with the decreasing loan spreads during expansion periods. Following Paligorova and Santos (2017), we also re-estimate the model specified in Eq. (2), by using the log amount of outstanding credit as the dependent variable instead of $SPREAD$. The results are reported in Table 4.

Exploiting within bank-firm and within bank-sector-time variation, we do not find a statistically significant decline in the outstanding amount of credit granted by private banks to the firms that are more levered, illiquid, less tangible, unprofitable, and with shorter-term debt maturity, while their loan spreads decrease relatively more during credit expansions. In addition, we observe a relatively increasing amount of credit accompanied by decreasing loan spreads for SMEs and high-growth firms. These results are consistent with the risk-taking channel that banks can perceive loans to be less risky during the expansion periods, and they may tend to loosen credit conditions to ex-ante riskier borrowers. (Paligorova & Santos, 2017, Ioannidou et al., 2015; Jiménez et al., 2014).

Table 4. Relative Cyclicality of Lending Amount over the Credit Cycle

	1 *LOAN*	2 *LOAN*
SME x EXPANSION	0.119**	
	(0.049)	
MICRO x EXPANSION		0.117**
		(0.057)
SMALL x EXPANSION		0.116**
		(0.052)
MEDIUM x EXPANSION		0.090**
		(0.043)
LEVERAGE x EXPANSION	-0.036	-0.038
	(0.053)	(0.052)
LIQUIDITY x EXPANSION	0.003	0.002
	(0.035)	(0.034)
TANGIBILITY x EXPANSION	-0.050	-0.049
	(0.036)	(0.036)
PROFITABILITY x EXPANSION	-0.052	-0.051
	(0.082)	(0.072)
ST DEBT RATIO x EXPANSION	0.008	0.008
	(0.026)	(0.025)
GROWTH x EXPANSION	0.032**	0.030**
	(0.014)	(0.012)
Firm Controls	Yes	Yes
Bank-Firm FE	Yes	Yes
Bank-Sector-Time FE	Yes	Yes
Observations	1,529,475	1,529,475
R-squared	0.531	0.534

The dependent variable in all regressions is the logarithm of outstanding credit between bank *b* and firm *f* at the end of year *t*, *LOAN*. The regression sample includes the observations of private bank-firm pairs. All bank-firm level and firm level independent variables are defined in Section 3.1. *EXPANSION* dummy is defined in Section 3.2. All regressions reported in Table 4 include bank-firm and bank-sector-time fixed effects, where sectors are defined at two-digit sector codes (NACE Rev. 2) based on the economic activity classification released by EUROSTAT. Also, each column singlehandedly includes firm characteristics in the interaction variables. Thus, the row of "Firm Controls" includes size dummies (*SME* or *MICRO*, *SMALL*, *MEDIUM*), *LEVERAGE*, *LIQUIDITY*, *TANGIBILITY*, *PROFITABILITY*, *ST DEBT RATIO*, and *GROWTH*. The coefficient estimates of "Firm Controls" are not reported in Table 4 for the sake of brevity. They are available in the extended version of Table 4 given in the Appendix (See Table A2). Standard errors are clustered at bank-time level. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

4.4 Firm Level Results

In this section, we investigate whether our bank-firm level results persist at the firm level. In Table 5, the first two columns present the firm level results on the evolution of loan spreads over the credit cycle for the full sample. To check whether the full sample results are driven by private banks, we next conduct our analyses for the samples of firms that have lending relationships with private banks (Column 3 and Column 4), and the firms that have lending relationships only with state-owned banks (Column 5 and Column 6).

Table 5. Firm-Level Results

	Full Sample		Firms with Private Bank Relation		Firms without Private Bank Relation	
	1	2	3	4	5	6
	SPREAD	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*
SME x EXPANSION	-0.052***		-0.054***		0.037	
	(0.006)		(0.006)		(0.023)	
MICRO x EXPANSION		-0.043***		-0.046***		0.047**
		(0.006)		(0.006)		(0.023)
SMALL x EXPANSION		-0.058***		-0.059***		0.030
		(0.006)		(0.006)		(0.023)
MEDIUM x EXPANSION		-0.048***		-0.048***		0.024
		(0.006)		(0.006)		(0.024)
LEVERAGE x EXPANSION	-0.032***	-0.030***	-0.029***	-0.028***	0.006	0.004
	(0.004)	(0.004)	(0.004)	(0.004)	(0.010)	(0.010)
LIQUIDITY x EXPANSION	0.025***	0.025***	0.021***	0.021***	0.036***	0.035***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.013)	(0.013)
TANGIBILITY x EXPANSION	0.024***	0.025***	0.025***	0.026***	0.008	0.010
	(0.004)	(0.004)	(0.004)	(0.004)	(0.010)	(0.010)
PROFITABILITY x EXPANSION	0.026***	0.028***	0.026***	0.028***	-0.009	-0.006
	(0.006)	(0.006)	(0.007)	(0.007)	(0.012)	(0.012)
ST DEBT RATIO x EXPANSION	-0.011***	-0.012***	-0.015***	-0.015***	0.005	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.007)
GROWTH x EXPANSION	-0.007***	-0.006***	-0.008***	-0.007***	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,071,260	1,071,260	922,380	922,380	148,880	148,880
R-squared	0.537	0.538	0.530	0.532	0.671	0.672

This table reports the coefficient estimates of the firm level analyses over the period 2011-2022. All firm level variables are defined in Section 3.1. *EXPANSION* dummy is defined in Section 3.2. *SPREAD* is the firm level weighted mean of loan spreads for each firm from their bank-firm pairs. All regressions reported in Table 5 include firm fixed effects and sector-time fixed effects, where sectors are defined at two-digit sector codes (NACE Rev. 2) based on the economic activity classification released by EUROSTAT. Also, each column singlehandedly includes firm characteristics in the interaction variables. Thus, the row of "Firm Controls" includes size dummies (*SME* or *MICRO*, *SMALL*, *MEDIUM*), *LEVERAGE*, *LIQUIDITY*, *TANGIBILITY*, *PROFITABILITY*, *ST DEBT RATIO*, and *GROWTH*. The coefficient estimates of "Firm Controls" are not reported in Table 5 for the sake of brevity. They are available in the extended version of Table 5 given in the Appendix (See Table A3). Standard errors are clustered at firm level. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Columns 1 and 2 show that SMEs experience a relatively higher reduction in the cost of their bank loans, and the group of small-sized firms is the one that benefits most from the falling loan spreads among SMEs during credit expansions. Firm level results also suggest that the loan spreads for more levered, illiquid, less tangible, unprofitable firms, high growth firms, and firms with short-term debt maturity structure decrease relatively more during credit expansions than for firms with sound balance sheet characteristics, in line with the bank-firm level results discussed in Section 4.2. The firm level results also support our bank-firm level results showing that convergence of loan spreads across riskier and financially sound firms is prevalent for the private banks, not for the state-owned banks. Table 5 shows that loan spreads of the smaller and riskier firms that have a lending relationship with private banks converge to the loan spreads of larger and financially sound firms during the credit expansions (Columns 3 and 4), whereas loan spreads of the firms that work only with state-owned banks do not display cyclicality with respect to all firm characteristics other than $LIQUIDITY$ (Columns 5 and 6).

4.5 Additional Robustness Tests

To further test the robustness of our results, we perform several additional analyses. First, we repeat our baseline analyses by winsorizing the variables in alternative ways. In our baseline regressions, we winsorize at the 1st percentile in each tail. Alternatively, we winsorize at 0.5% and 0.25% in each tail. The results are similar to those reported in section 4.2.[18] Second, we repeat our analyses by two-way clustering standard errors at bank and firm level. Our findings are robust to the use of alternative clustering (See Table A4).

A small fraction of firms, representing 5% of firms, hold FX-denominated loans over the sample period. Since the FX credit usage is heavily regulated in Türkiye, we focus on local currency-denominated loans in our baseline analyses. To ensure that our results are not affected by switching between local currency-denominated and FX-denominated loans over the credit cycle, we repeat our analyses but exclude the firms with FX loans. We obtain similar results to those reported in Section 4.2 suggesting no bias due to a limited number of firms with FX loans (See Table A5).

We also repeat our analyses by using an alternative definition of SME, $MICRO$, $SMALL$, and $MEDIUM$ variables based on the classification of Small and Medium Enterprises Development Organization of Türkiye (KOSGEB). When classifying firm size groups, KOSGEB considers the net sales and revenue of firms in addition to their employment level.[19] As another alternative, we use the logarithm of total employees as a measure of firm size. Using these alternative firm size measures yields similar results to those reported in Section 4.2.[20]

[18] For the sake of brevity, they are not reported but they are available upon request.
[19] The threshold levels have been updated by KOSGEB several times over the sample period. For detailed information, see https://www.kosgeb.gov.tr/
[20] For the sake of brevity, they are not reported but they are available upon request.

5. Conclusion

Using bank-firm level credit registry data and firm level financial statements covering the universe of all incorporated firms in Türkiye, this paper analyzes the firm heterogeneity in the evolution of loan spreads over the credit cycle between 2011 and 2022. Our bank-firm level analyses show that firms that are riskier and more prone to financial frictions pay higher interest rates on bank loans. We then examine the cyclicality of lending standards and show that loan spreads of these firms converge to the spreads of large and financially sound firms during the expansion periods. On the other hand, controlling firm riskiness and other firm characteristics, SME loan spreads rise more relative to those of large firms during credit tightening periods. This reveals the asymmetric deterioration in SMEs' lending conditions relative to large firms. However, these findings are valid only for private banks but not for state-owned banks.

We also document that these results persist at the firm level. In line with the bank-firm level results, our firm level analyses show that loan spreads of the smaller and riskier firms that have a lending relationship with private banks converge to the loan spreads of larger and financially sound firms during the credit expansions, whereas loan spreads of the firms that work only with state-owned banks do not exhibit cyclicality.

Our results suggest that the significant role of firm riskiness on loan spreads weakens during expansion periods. Consistent with the risk-taking channel, this suggests that private banks may reduce screening and tend to loosen credit conditions to ex-ante uncreditworthy borrowers during expansion periods. Examining the potential ramifications of this channel for financial stability would be fruitful for future research. While quantifying the detrimental impact of this channel on financial stability remains unclear, our findings lend support to policymakers' prudent approaches over the credit cycle.

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Appendix

Table A1. Extended Version of Table 3

	Full Sample		Private Banks		State-Owned Banks	
	1	2	3	4	5	6
	SPREAD	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*
SME x EXPANSION	-0.033		-0.059**		0.027	
	(0.024)		(0.029)		(0.039)	
MICRO x EXPANSION		-0.025		-0.059*		0.051
		(0.030)		(0.035)		(0.055)
SMALL x EXPANSION		-0.040		-0.065**		0.021
		(0.025)		(0.031)		(0.039)
MEDIUM x EXPANSION		-0.026*		-0.043**		0.014
		(0.016)		(0.020)		(0.022)
LEVERAGE x EXPANSION	-0.043***	-0.041***	-0.051***	-0.051***	-0.026	-0.019
	(0.015)	(0.014)	(0.016)	(0.016)	(0.031)	(0.028)
LIQUIDITY x EXPANSION	0.021**	0.021**	0.033***	0.033***	-0.005	-0.005
	(0.009)	(0.009)	(0.011)	(0.011)	(0.016)	(0.016)
TANGIBILITY x EXPANSION	0.012	0.013*	0.021**	0.020**	-0.005	-0.001
	(0.008)	(0.008)	(0.010)	(0.010)	(0.012)	(0.011)
PROFITABILITY x EXPANSION	0.024	0.027	0.042*	0.040**	-0.019	-0.004
	(0.019)	(0.016)	(0.021)	(0.019)	(0.037)	(0.031)
ST DEBT RATIO x EXPANSION	-0.009**	-0.010**	-0.016***	-0.015***	0.004	0.002
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)
GROWTH x EXPANSION	-0.009***	-0.008***	-0.006*	-0.006*	-0.014***	-0.013***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	-0.004)
SME	0.047***		0.071***		-0.010	
	(0.014)		(0.016)		(0.023)	
MICRO		0.156***		0.204***		0.052
		(0.022)		(0.023)		(0.037)
SMALL		0.099***		0.132***		0.023
		(0.017)		(0.018)		(0.028)
MEDIUM		0.039***		0.058***		-0.007
		(0.010)		(0.012)		(0.015)
LEVERAGE	0.075***	0.075***	0.084***	0.086***	0.055***	0.053***
	(0.009)	(0.009)	(0.012)	(0.011)	(0.014)	(0.013)
LIQUIDITY	-0.061***	-0.061***	-0.076***	-0.076***	-0.028***	-0.028***
	(0.007)	(0.007)	(0.009)	(0.009)	(0.008)	(0.008)
TANGIBILITY	-0.045***	-0.042***	-0.050***	-0.047***	-0.034***	-0.034***
	(0.007)	(0.006)	(0.009)	(0.009)	(0.006)	(0.006)
PROFITABILITY	-0.091***	-0.087***	-0.104***	-0.098***	-0.058***	-0.063***
	(0.012)	(0.011)	(0.015)	(0.014)	(0.017)	(0.015)
ST DEBT RATIO	0.015***	0.015***	0.020***	0.019***	0.005	0.007
	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)
GROWTH	-0.007***	-0.006***	-0.009***	-0.008***	-0.003	-0.003*
	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Bank-Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,237,206	2,237,206	1,529,475	1,529,475	707,731	707,731
R-squared	0.672	0.673	0.604	0.605	0.662	0.663

This table reports the coefficient estimates of the regressions in Eq. (2) for bank-firm pairs over 2011-2022. All bank-firm level and firm level variables are defined in Section 3.1. *EXPANSION* dummy is defined in Section 3.2. All regressions reported in Table A1 include bank-firm and bank-sector-time fixed effects, where sectors are defined at two-digit sector codes (NACE Rev. 2) based on the economic activity classification released by EUROSTAT. Standard errors are clustered at bank-time level. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Table A2. Extended Version of Table 4

	1 *LOAN*	2 *LOAN*
SME x EXPANSION	0.119**	
	(0.049)	
MICRO x EXPANSION		0.117**
		(0.057)
SMALL x EXPANSION		0.116**
		(0.052)
MEDIUM x EXPANSION		0.090**
		(0.043)
LEVERAGE x EXPANSION	-0.036	-0.038
	(0.053)	(0.052)
LIQUIDITY x EXPANSION	0.003	0.002
	(0.035)	(0.034)
TANGIBILITY x EXPANSION	-0.050	-0.049
	(0.036)	(0.036)
PROFITABILITY x EXPANSION	-0.052	-0.051
	(0.082)	(0.072)
ST DEBT RATIO x EXPANSION	0.008	0.008
	(0.026)	(0.025)
GROWTH x EXPANSION	0.032**	0.030**
	(0.014)	(0.012)
SME	-0.727***	
	(0.040)	
MICRO		-1.812***
		(0.059)
SMALL		-1.242***
		(0.047)
MEDIUM		-0.667***
		(0.038)
LEVERAGE	0.595***	0.585***
	(0.047)	(0.046)
LIQUIDITY	0.119***	0.119***
	(0.028)	(0.028)
TANGIBILITY	0.275***	0.245***
	(0.029)	(0.028)
PROFITABILITY	0.349***	0.303***
	(0.058)	(0.052)
ST DEBT RATIO	-0.244***	-0.237***
	(0.022)	(0.021)
GROWTH	0.077***	0.069***
	(0.007)	(0.007)
Bank-Firm FE	Yes	Yes
Bank-Sector-Time FE	Yes	Yes
Observations	1,529,475	1,529,475
R-squared	0.531	0.534

The dependent variable in all regressions is the logarithm of outstanding credit between bank *b* and firm *f* at the end of year *t*, *LOAN*. The regression sample includes the observations of private bank-firm pairs. All bank-firm level and firm level independent variables are defined in Section 3.1. *EXPANSION* dummy is defined in Section 3.2. All regressions reported in Table A2 include bank-firm and bank-sector-time fixed effects, where sectors are defined at two-digit sector codes (NACE Rev. 2) based on the economic activity classification released by EUROSTAT. Standard errors are clustered at bank-time level. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Table A3. Extended Version of Table 5

	Full Sample		Firms with Private Bank Relation		Firms without Private Bank Relation	
	1	2	3	4	5	6
	SPREAD	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*
SME x EXPANSION	-0.052***		-0.054***		0.037	
	(0.006)		(0.006)		(0.023)	
MICRO x EXPANSION		-0.043***		-0.046***		0.047**
		(0.006)		(0.006)		(0.023)
SMALL x EXPANSION		-0.058***		-0.059***		0.030
		(0.006)		(0.006)		(0.023)
MEDIUM x EXPANSION		-0.048***		-0.048***		0.024
		(0.006)		(0.006)		(0.024)
LEVERAGE x EXPANSION	-0.032***	-0.030***	-0.029***	-0.028***	0.006	0.004
	(0.004)	(0.004)	(0.004)	(0.004)	(0.010)	(0.010)
LIQUIDITY x EXPANSION	0.025***	0.025***	0.021***	0.021***	0.036***	0.035***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.013)	(0.013)
TANGIBILITY x EXPANSION	0.024***	0.025***	0.025***	0.026***	0.008	0.010
	(0.004)	(0.004)	(0.004)	(0.004)	(0.010)	(0.010)
PROFITABILITY x EXPANSION	0.026***	0.028***	0.026***	0.028***	-0.009	-0.006
	(0.006)	(0.006)	(0.007)	(0.007)	(0.012)	(0.012)
ST DEBT RATIO x EXPANSION	-0.011***	-0.012***	-0.015***	-0.015***	0.005	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.007)
GROWTH x EXPANSION	-0.007***	-0.006***	-0.008***	-0.007***	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)
SME	0.045***		0.053***		-0.013	
	(0.007)		(0.007)		(0.032)	
MICRO		0.152***		0.179***		0.000
		(0.008)		(0.008)		(0.033)
SMALL		0.093***		0.108***		-0.004
		(0.008)		(0.008)		(0.033)
MEDIUM		0.036***		0.042***		-0.009
		(0.007)		(0.007)		(0.033)
LEVERAGE	0.064***	0.065***	0.049***	0.051***	0.051***	0.052***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.010)	(0.010)
LIQUIDITY	-0.070***	-0.071***	-0.074***	-0.074***	-0.034***	-0.034***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.011)	(0.011)
TANGIBILITY	-0.065***	-0.062***	-0.062***	-0.058***	-0.043***	-0.044***
	(0.005)	(0.005)	(0.006)	(0.005)	(0.011)	(0.011)
PROFITABILITY	-0.053***	-0.051***	-0.064***	-0.060***	-0.011	-0.011
	(0.005)	(0.005)	(0.005)	(0.005)	(0.009)	(0.009)
ST DEBT RATIO	0.025***	0.025***	0.034***	0.034***	0.006	0.007
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.007)
GROWTH	-0.010***	-0.009***	-0.010***	-0.009***	-0.007***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,071,260	1,071,260	922,380	922,380	148,880	148,880
R-squared	0.537	0.538	0.530	0.532	0.671	0.672

This table reports the coefficient estimates of the firm level analyses over the period 2011-2022. All firm level variables are defined in Section 3.1. *EXPANSION* dummy is defined in Section 3.2. *SPREAD* is the firm level weighted mean of loan spreads for each firm from their bank-firm pairs. All regressions reported in Table A3 include firm fixed effects and sector-time fixed effects where sectors are defined at two-digit sector codes (NACE Rev. 2) based on the economic activity classification released by EUROSTAT. Standard errors are clustered at firm level. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Table A4. Evolution of Loan Spreads over the Credit Cycle with Alternative Clustering

	Full Sample		Private Banks		State-Owned Banks	
	1	2	3	4	5	6
	SPREAD	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*
SME x EXPANSION	-0.033		-0.059**		0.027**	
	(0.024)		(0.028)		(0.006)	
MICRO x EXPANSION		-0.025		-0.059*		0.051**
		(0.028)		(0.032)		(0.009)
SMALL x EXPANSION		-0.040		-0.065**		0.021*
		(0.025)		(0.030)		(0.006)
MEDIUM x EXPANSION		-0.026		-0.043**		0.014
		(0.017)		(0.020)		(0.006)
LEVERAGE x EXPANSION	-0.043***	-0.041***	-0.051***	-0.051***	-0.026	-0.019
	(0.009)	(0.009)	(0.011)	(0.012)	(0.011)	(0.010)
LIQUIDITY x EXPANSION	0.021**	0.021**	0.033***	0.033***	-0.005**	-0.005**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.001)	(0.001)
TANGIBILITY x EXPANSION	0.012*	0.013**	0.021***	0.020***	-0.005	-0.001
	(0.006)	(0.005)	(0.005)	(0.005)	(0.004)	(0.003)
PROFITABILITY x EXPANSION	0.024	0.027**	0.042***	0.040***	-0.019	-0.004
	(0.014)	(0.012)	(0.014)	(0.012)	(0.014)	(0.013)
ST DEBT RATIO x EXPANSION	-0.009**	-0.010**	-0.016***	-0.015***	0.004	0.002
	(0.004)	(0.004)	(0.005)	(0.005)	(0.003)	(0.004)
GROWTH x EXPANSION	-0.009***	-0.008**	-0.006*	-0.006	-0.014*	-0.013*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
SME	0.047**		0.071***		-0.010	
	(0.019)		(0.020)		(0.012)	
MICRO		0.156***		0.204***		0.052
		(0.035)		(0.037)		(0.038)
SMALL		0.099***		0.132***		0.023
		(0.025)		(0.026)		(0.024)
MEDIUM		0.039**		0.058***		-0.007
		(0.016)		(0.017)		(0.011)
LEVERAGE	0.075***	0.075***	0.084***	0.086***	0.055**	0.053**
	(0.006)	(0.007)	(0.006)	(0.006)	(0.008)	(0.009)
LIQUIDITY	-0.061***	-0.061***	-0.076***	-0.076***	-0.028*	-0.028*
	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)	(0.008)
TANGIBILITY	-0.045***	-0.042***	-0.050***	-0.047***	-0.034***	-0.034***
	(0.007)	(0.006)	(0.009)	(0.008)	(0.003)	(0.003)
PROFITABILITY	-0.091***	-0.087***	-0.104***	-0.098***	-0.058**	-0.063**
	(0.017)	(0.015)	(0.022)	(0.021)	(0.008)	(0.007)
ST DEBT RATIO	0.015***	0.015***	0.020***	0.019***	0.005*	0.007*
	(0.004)	(0.004)	(0.004)	(0.005)	(0.002)	(0.002)
GROWTH	-0.007***	-0.006***	-0.009***	-0.008***	-0.003**	-0.003**
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Bank-Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,237,206	2,237,206	1,529,475	1,529,475	707,731	707,731
R-squared	0.672	0.673	0.604	0.605	0.662	0.663

This table reports the coefficient estimates of the regressions in Eq. (2) for bank-firm pairs over 2011-2022. All bank-firm level and firm level variables are defined in Section 3.1. *EXPANSION* dummy is defined in Section 3.2. All regressions reported in Table A4 include bank-firm and bank-sector-time fixed effects, where sectors are defined at two-digit sector codes (NACE Rev. 2) based on the economic activity classification released by EUROSTAT. Standard errors are two-way clustered at bank and firm level. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Table A5. Evolution of Loan Spreads over the Credit Cycle Excluding FX-Denominated Credit Holders

	Full Sample		Private Banks		State-Owned Banks	
	1	2	3	4	5	6
	SPREAD	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*	*SPREAD*
SME x EXPANSION	-0.017		-0.042*		0.038	
	(0.021)		(0.025)		(0.037)	
MICRO x EXPANSION		-0.008		-0.039		0.059
		(0.027)		(0.031)		(0.051)
SMALL x EXPANSION		-0.023		-0.047*		0.031
		(0.021)		(0.026)		(0.036)
MEDIUM x EXPANSION		-0.016		-0.032*		0.022
		(0.013)		(0.016)		(0.020)
LEVERAGE x EXPANSION	-0.049***	-0.047***	-0.060***	-0.059***	-0.030	-0.025
	(0.015)	(0.015)	(0.016)	(0.015)	(0.031)	(0.030)
LIQUIDITY x EXPANSION	0.018**	0.018**	0.029***	0.029***	-0.001	-0.002
	(0.009)	(0.009)	(0.010)	(0.010)	(0.016)	(0.017)
TANGIBILITY x EXPANSION	0.013*	0.015**	0.024**	0.024**	-0.004	-0.000
	(0.008)	(0.007)	(0.010)	(0.010)	(0.011)	(0.010)
PROFITABILITY x EXPANSION	0.011	0.016	0.028	0.028*	-0.024	-0.009
	(0.016)	(0.014)	(0.017)	(0.015)	(0.032)	(0.026)
ST DEBT RATIO x EXPANSION	-0.009*	-0.010**	-0.018***	-0.018***	0.007	0.004
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)
GROWTH x EXPANSION	-0.009***	-0.008***	-0.005	-0.005	-0.015***	-0.013***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)
SME	0.028**		0.049***		-0.020	
	(0.013)		(0.014)		(0.022)	
MICRO		0.092***		0.134***		0.008
		(0.018)		(0.019)		(0.032)
SMALL		0.060***		0.090***		-0.004
		(0.014)		(0.015)		(0.025)
MEDIUM		0.024***		0.041***		-0.013
		(0.009)		(0.010)		(0.015)
LEVERAGE	0.082***	0.081***	0.093***	0.094***	0.061***	0.059***
	(0.010)	(0.009)	(0.012)	(0.011)	(0.016)	(0.015)
LIQUIDITY	-0.050***	-0.050***	-0.064***	-0.064***	-0.024***	-0.024***
	(0.007)	(0.007)	(0.009)	(0.009)	(0.009)	(0.008)
TANGIBILITY	-0.027***	-0.026***	-0.030***	-0.029***	-0.021***	-0.022***
	(0.006)	(0.006)	(0.009)	(0.009)	(0.006)	(0.007)
PROFITABILITY	-0.057***	-0.057***	-0.067***	-0.065***	-0.035**	-0.041***
	(0.009)	(0.008)	(0.012)	(0.011)	(0.013)	(0.010)
ST DEBT RATIO	0.010**	0.010***	0.016***	0.015***	-0.000	0.001
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
GROWTH	-0.004***	-0.003**	-0.005***	-0.005***	-0.001	-0.001
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Bank-Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Sector-Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,713,209	1,713,209	1,123,897	1,123,897	589,312	589,312
R-squared	0.695	0.695	0.609	0.609	0.690	0.690

This table reports the coefficient estimates of the regressions in Eq. (2) for samples excluding the firms that are FX-denominated credit holders over the period 2011-2022. All firm level variables are defined in Section 3.1. EXPANSION dummy is defined in Section 3.2. All regressions reported in Table A6 include bank-firm and bank-sector-time fixed effects where sectors are defined at two-digit sector codes (NACE Rev. 2) based on the economic activity classification released by EUROSTAT. Standard errors are clustered at bank-time level. *, **, and *** indicate statistical significance at 10%, 5% and 1%, respectively.

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