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Full Length Article

Firm Size and Financing Behavior during COVID-19 Pandemic: Evidence from SMEs in Istanbul

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Abstract

This paper examines how small and medium-size enterprises (SMEs) in Istanbul managed their financial needs during the COVID-19 pandemic. A unique survey was conducted in May–June 2021 to analyze the effect of the pandemic on financial conditions and access to finance. The paper maps the differences between firms in terms of their financing conditions and behavior based on their size during the pandemic. The novel data set helps to conceptualize the impact of the COVID-19 pandemic on SMEs. The paper makes a contribution to the literature through using a large number of variables related to firms' financial conditions and opportunities (e.g., credit restructuring, debt postponing, capital injection). The paper hypothesizes that SMEs are less likely than large firms to access formal finance opportunities, but they tend to rely more on informal financing. The empirical findings suggest that, during the pandemic, micro and small firms tend to borrow more from their acquaintances, such as relatives and friends. Micro firms are less likely to restructure their outstanding loans, borrow from banks, or inject capital. Furthermore, micro firms tend to cut their costs more to avoid further difficulty in their financiaVl positions. Micro and small firms tend to apply for bank loans less than large firms, while medium-size firms are more likely to apply. Micro and small firms are more inclined to report difficulty in accessing credit.

JEL classification: D22; G21; H81

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1. Introduction

The COVID-19 outbreak turned into one of the most widely spread pandemics in human history. As of October 2022, more than 600 million cases had been recorded since the end of January 2020, with over 6.5 million deaths worldwide (World Health Organization, 2022). Beyond the human losses and the significant challenge for health systems, it has caused severe negative social and economic results in many countries. The COVID-19 pandemic rapidly led to one of the most formidable economic crises in the past century and the worst economic downturn since the Great Depression in the 1920s (IMF, 2020; World Bank, 2021), however, these negative effects had a greater impact on emerging markets (EMs).

Firms experienced negative economic effects because of the worldwide disruptions caused by the pandemic through various channels. Sluggish demand, supply chain disruptions, and rising production costs put significant pressure on firms. These supply- and demand-side problems made it very difficult for firms to carry out their daily business activities or to take

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advantage of new investment opportunities, even though access to external finance was even more vital for firms than usual during the pandemic.

Because of some economic and political constraints, not every country can offer the same degree of generous support to its firms. Advanced economies are usually better equipped and thus can weather the negative impact of the COVID-19 shock, especially through direct support, whereas EMs face more difficulty in extending rescue packages to households as well as small and medium-size enterprises (SMEs). Theoretical and empirical studies both point out that SMEs have greater challenges in accessing finance during economic and financial crises, when the level of uncertainty and volatility rises (Carbo-Valverde et al., 2016; Demirgüç-Kunt et al., 2020; Stiglitz & Weiss, 1981). Although firms are supported in a coordinated manner through expansionary monetary and fiscal policy instruments, business problems, such as credit contraction and bankruptcy, are still widespread for SMEs (Gourinchas et al., 2021).

Limited fiscal room for maneuver and macroeconomic weakness have forced developing countries to support domestic firms at a relatively modest rate and extent during the pandemic, worsening the financial conditions of SMEs. In that regard, it is worth investigating how SMEs differ from large firms in meeting their financing needs during the pandemic, especially in developing countries.

Using a unique firm-level survey, this paper examines how SMEs in Istanbul, which is the economic center of Türkiye, a vibrant EM, have met their financial needs during the pandemic. Türkiye was the only G-20 country other than China to achieve positive GDP growth in 2020, with growth of 1.9 percent. In 2021, after a significant period of recovery, the country posted a growth rate of 11.4 percent. However, at the same time, differences have continued in both industrial and firm-level performance, as some of them have not recovered at such a rapid pace. For instance, the services sector shrank by 5.6 percent in 2020, though it grew by 21.1 percent in 2021, and, despite signs of better performance in 2021, financial and insurance activities contracted by 9 percent in 2021. During the pandemic, SMEs showed some resilience as the supply chains mostly remained intact, though access to finance remains an issue, and higher borrowing costs were detrimental to SMEs' business performance, especially in 2021.

COVID-19 has been, by far, the most severe public health threat in Türkiye's modern history, with the number of cases exceeding 5,250,000, and deaths totaling nearly 48,000 from March 11, 2020, when the first case was recorded, and June 2, 2021, which is the endpoint of our survey. To prevent the health crisis from turning into an economic crisis, the Turkish government initiated multidimensional policies, including a wide range of credit lines in support of businesses that were affected by the measures intended for the protection of public health. Credit channels such as the credit guarantee fund were mostly extended to SMEs via private and public banks over the period covered by our survey-based analysis.

An immediate stimulus package of TRY 100 billion (USD10 billion) called the Economic Stability Shield, consisting of 21 measures, was implemented for the Central Bank of the Republic of Turkey (CBRT), and the Banking Regulation and Supervision Agency (BRSA) took bold steps to maintain liquidity in the banking sector as well as preserving financial stability while becoming more flexible. On March 17, 2020, the CBRT cut the policy rate by 100 basis points (bps), to 9.75 percent from 10.75, and then held two consecutive meetings in a month at which it extended needed liquidity to banks through direct injections of repurchase (repo) auctions with maturity terms of up to 91 days in addition to the regular one-week repo auctions. Asset-backed securities and mortgage-backed securities were included in the collateral pool. At the same time, the central bank reduced the foreign exchange (FX) reserve requirement ratio by 500 bps for banks that satisfy the real credit growth criteria (Apergis et al., 2022). As of March 20, 2020, the maximum maturity for rediscount credits was extended from 120 days to 240 days for short-term credit utilization and up to 720 days for longer-term credit utilization, and TRY-denominated rediscount credits for exports were offered an overall limit of TRY 60 billion. Also, the open market operations (OMO) conditions were relaxed, and the ratio of the OMO portfolio to the central bank's balance was increased to 10 percent from the previous 5 percent. Commercial banks postponed loan repayment for businesses and households.

On the fiscal front, the government postponed tax payments and social security insurance payments as well as deferring income tax filing and payment for 1.9 million people. The lowest retirement pension was increased to TRY 1500 and a lump-sum amount of TRY 1000 was given to more than 2 million people, along with some TRY 20 billion cash in salary support and TRY 7 billion in minimum wage support.

As of August 2021, fiscal and financial support since March 2020 totaled around TRY 705.5 billion (10.6% of Türkiye's gross domestic product [GDP]). Credit totaled around TRY 528.5 billion, of which some TRY 270 billion came from the public banks. Other than newly extended and restructured credit lines along with monetary support through the unemployment insurance fund and social solidarity fund, direct government payments comprised TRY 108.7 billion for the same period—an increase of almost 2.1 percent of GDP, facilitated via direct transfers and tax reductions, exemptions, or amnesty. The labor force has been preserved through short-term working allowances and a ban on firing, from April 2020 to June 30, 2021.

The Turkish government extended massive credit during the COVID-19 outbreak, but SMEs have found it harder to benefit from both direct and indirect support, especially with respect to credit. Moreover, they faced additional challenges due to macroeconomic volatility, such as rapid depreciation of the domestic currency, a worsening inflation outlook, rising interest rates, and increased uncertainty, as second and even third waves of pandemic hit the country. However, all these judgments require firm-level data and empirical scrutiny. Therefore, this paper fill the gap in the literature by exploring these issues empirically with a novel firm-level dataset.

Overall, this paper contributes to two strands of literature. Some studies analyze the difficulties faced by firms, especially

SMEs, during the COVID-19 pandemic, using survey-based methods (see Bartik et al., 2020; Cowling et al., 2021; Ferrando & Ganoulis, 2020; Guerrero-Amezaga et al., 2022). Thus, our paper first adds to this recently emerging empirical literature by addressing the financing channels of firms of different sizes. Second, empirical studies that have increased in number in the past decade reveal that SMEs have more difficulty in accessing external finance in times of crisis (see Beck & Demirguc-Kunt, 2006; Carbo-Valverde et al., 2016; Cowling et al., 2012; Demirgüç-Kunt et al., 2020; McGuinness & Hogan, 2016); our paper provides new evidence by analyzing the effect of the COVID-19 pandemic, which was a combination of a public health and an economic crisis. In addition, our novel dataset enables us to conceptualize the impact of the COVID-19 pandemic on SMEs better in a less studied EM context. As a contribution to the literature, this paper considers and uses more variables related to financial conditions and opportunities for firms (e.g., credit restructuring, debt postponement, capital injection).

Our empirical results can be summarized as follows. Not surprisingly, during the COVID-19 pandemic, both micro and small firms tend to borrow more from their acquaintances, such as relatives and friends, to access finance. Micro enterprises differ further in their financing opportunities and preferences. They are less likely to restructure their outstanding loans, obtain bank loans, and inject capital and tend to cut costs more to avoid further difficulty in their financial position. Although micro and small firms both apply for bank loans less than large firms, medium-size firms are more likely to use them. Micro and small firms are more inclined to report that they faced difficulty in accessing bank credit during the pandemic, such as extension of the loan approval period, application rejection, and higher collateral required than in normal conditions.

The structure of the paper is as follows. Section 2 presents the theoretical background and the literature review. Section 3 outlines data, variables, and empirical methodology. Section 4 presents our main results and robustness checks. Section 5 offers some concluding remarks.

2. Theoretical background, literature review, and hypotheses

Among the most significant obstacles to the growth of firms in the business environment is difficulty in accessing finance (Beck et al., 2005; Gur, 2012). In a theoretical paper, Cabral and Mata (2003) show that financial constraints cause underinvestment by small firms, which prevents them from reaching their optimal firm size. Financial development helps to expand the pool of financial resources, keeps collateral requirements at reasonable levels, reduces the cost of borrowing, extends loan maturity, introduces alternative financing models to the credit mechanism, helps in managing financial risks, and enables firms and sectors to grow more quickly through more investment, exportation, and innovation (Hsu et al., 2014; Levine, 2005; Levine et al., 2018; Manova, 2013; Rajan & Zingales, 1998). In theory, a well-functioning financial system contributes to the emergence of a Schumpeterian growth dynamic by increasing and diversifying much-needed financing opportunities for promising young firms and entrepreneurs so that they can challenge incumbent firms (Aghion et al., 2005; Laeven et al., 2015).

Although access to finance is vital, many firms, especially SMEs, still have difficulty in obtaining external finance. In times of increased uncertainty and market disruption, it becomes even more difficult for firms to find resources to finance their daily business operations and investment (Besley, 1994; Bordo et al., 2016; Gozgor et al., 2019; Stiglitz & Weiss, 1981). Natural disasters (Berg & Schrader, 2012; McDermott et al., 2014), sudden geopolitical events (Khwaja & Mian, 2008), and crises cause external financing opportunities to dry up and create bottlenecks for firms. In such periods, banks are usually reluctant to lend to SMEs, as high uncertainty reduces their pool of qualified borrowers. When the credit dries up, capital market instrument can be used as an alternative. However, because capital markets are shallow in many EMs, SMEs operating in these countries have very little access to capital market instruments. Firms disappointed with the financial markets might turn to informal financing channels, such as trade credit and borrowing from friends and relatives (Allen et al., 2005, 2019; Petersen & Rajan, 1994).

The COVID-19 pandemic affected firms' access to finance and their financing preferences because of shrinking demand and supply-side issues, on the one hand, and its impact on the risk perception and resource allocation preferences of financial markets, on the other. In such a chaotic environment, with overlapping massive risks and uncertainty shocks, firms are expected to use different financial opportunities to survive. It is not surprising that firms of different sizes try to meet their financing needs in different ways based on their firm-level risks/characteristics/opportunities (e.g., credit score, the availability of collateral, the choice between arm's-length and relationship-based finance, shareholding structure), or macroeconomic conditions. The literature provides us with important clues and evidence in this regard.

As the level of risk and uncertainty increases during economic slowdowns and crises, banks charge higher interest rates and require more collateral to compensate for the additional risk and uncertainty associated with investing in small firms (Cowling et al., 2012). In times of crisis, because their internal financing opportunities are narrowing, SMEs tend to turn to external financing opportunities, such as credit and equity financing. Cowling et al. (2012: 781) summarize this situation briefly as follows: “younger and smaller firms are more likely to require outside financing as their internal resources (owner's wealth, retained profits and cashflow) are unable to finance new investment and growth opportunities fully. These general problems can be exacerbated in periods of low demand when cash flows tighten and profits decline, and business survival requires an injection of capital to maintain liquidity until demand grows again.” The increasing credit crunch that SMEs have faced during the COVID-19 period might have other causes as well. Berrospide et al. (2021) state that “buffer-constrained” banks have reduced loan commitments to the SMEs more, and they are more likely to end pre-existing loan

agreements with such firms than with "buffer-unconstrained" banks. Lenders' low ability to mitigate the risks of the COVID-19 outbreak put additional pressure on limiting the provision of loans for all but the lowest-risk borrowers, that is, large firms. As mentioned in the World Development Report (2022), if financial markets continue to foster such a cycle, a widespread reduction in credit to SMEs, in particular, micro enterprises, might lead to large-scale market exits.

Firms might refrain from applying for external financing out of fear of rejection during crises, when information asymmetry increases (for a theoretical discussion, see Kon & Storey, 2003). When risks and uncertainty are high, demand for credit may decline not only because of the "discouraged borrowers" effect but also for different reasons and motivations. Under volatile economic conditions, firms might also prefer to reduce their demand for credit or shorten their debt maturity as long-term financial contracts and credits with covenants reduce the financial flexibility of firms (for a theoretical discussion, see Brunnermeier & Oehmke, 2013). As firms' expectations for the future fall in such periods, their demand for loans for investment, if not for working capital, might decline.

Table 1 summarizes the findings in the empirical literature on changes in SMEs' access to credit and financing conditions during an economic crisis. Cowling et al. (2012) use firm-level survey data to examine how loan supply and demand conditions differed for firms of different sizes and characteristics in the UK during the global financial crisis (GFC). Their results reveal that the credit supply was directed mostly at large firms. Among SMEs, micro firms had more difficulty in accessing credit than others. Six months after the GFC began (February 2009), 10 percent of small firms had their loan applications rejected, and credit rationing hit its peak. A year later, in parallel with relaxation in the banking sector with the decrease of uncertainty in the market, the rejection rate decreased to 4.8 percent. Cowling et al. (2016) show that the discouraged borrower effect was not significant among SMEs in the UK during the GFC. Popov and Udell (2012) show that, in 16 developing countries in Central and Eastern Europe, SMEs working with wounded banks, which suffered damage caused by the GFC more because of declining bank capital and asset losses, experienced more difficulty in accessing credit during the crisis. DeYoung et al. (2015) find that SMEs were more likely than large firms to face credit rationing in the US during the GFC, except that some community banks with a strong lender–borrower relationship increased their credit supply to SMEs. Using a firm-level database that includes 75 countries and covers the period 2004–2011, Demirgüç-Kunt et al. (2020) investigate the effect of the GFC on evolution in firms' capital structure. Their empirical results reveal that firm leverage and debt maturity declined significantly after the GFC. These adverse financial effects are experienced more by SMEs, especially unlisted firms, and they are more pronounced in countries with less efficient legal systems and less developed financial markets.

As discussed above, informal financing methods, such as trade credits and loans from family and friends, are expected to come into play in a substitute or complementary manner, helping companies survive when formal financing channels offered by financial institutions dry up. The empirical findings also indicate that SMEs benefit from informal financing resources during periods of high risk, uncertainty, and volatility. Carbo-Valverde et al. (2016) find that the dependence of credit-constrained SMEs on trade credits increased during periods of financial crisis in Spain. Using firm-level data on 34 countries

Table 1
A brief summary of the empirical literature.

Article	Country or Group of Countries	Type of Shock	Main Findings
Cowling et al. (2012)	UK	Global Financial Crisis	Micro-sized firms faced more difficulties in accessing credit. Loans directed more towards large firms
Cowling et al. (2016)	UK	Global Financial Crisis	There is no significant evidence on 'discouraged borrower' hypothesis for SMEs
Carbo-Valverde et al. (2016)	Spain	Global Financial Crisis	The dependency of credit-constrained SMEs on trade credits increased during the crisis.
McGuinness and Hogan (2016)	Ireland	Global Financial Crisis	Trade credit became more important for SMEs that were less liquid, highly dependent on short-term bank finance, and with more intangible assets
Andrieu et al. (2018)	11 European countries	Global Financial Crisis	Bank loans and commercial loans were complementary for SMEs
Demirgüç-Kunt et al. (2020)	75 Countries	Global Financial Crisis	Firm leverage and debt maturity declined more in SMEs, especially non-listed ones, after the crisis
Apedo-Amah et al. (2020)	56 countries	COVID-19	Small firms were more financially constrained
Bartik et al. (2020)	USA	COVID-19	Small firms suffered more from cash shortages.
Ferrando and Ganoulis (2020)	12 Euro area countries	COVID-19	Expectations of both SMEs and large firms for bank loans deteriorated. Micro and small firms had more positive conditional expectations for trade credits.
Liu et al. (2022)	China	COVID-19	SMEs decreased their loan demand significantly in Hubei, the starting point of the pandemic, compared to SMEs in other provinces.
Cowling et al. (2021)	UK	COVID-19	Micro and small-sized firms demanded loan relatively more than others.

during the period 1990 to 2011, Levine et al. (2018) find that liquidity-dependent firms in high-trust countries receive more trade credit and perform better in terms of profit and employment levels during banking crises than similar firms in low-trust economies, indicating that trade credit as an informal finance option compensates for the credit crunch during a banking crisis. Using panel data methods, McGuinness and Hogan (2016) examine how the bank loan and trade credit composition of Irish SMEs changed during the GFC. Their empirical findings reveal that, despite contraction in net trade credit, such as in bank loans, trade credit became more important for financially "vulnerable" SMEs, which were less liquid, highly dependent on short-term bank finance, and had higher levels of intangible assets, during the GFC. These results prove that trade credit acted as a substitute for bank loans for Irish SMEs during the GFC. In a firm-level survey-based empirical paper, however, Andrieu et al. (2018) show that bank loans and commercial loans were complementary, rather than substitutes, for SMEs in 11 European countries from 2009 to 2014, when the effects of the GFC were felt quite heavily. Informal financing methods for SMEs are not limited to trade credits. Some empirical papers also show that financially constrained SMEs in EMs, such as China and Vietnam, borrow from the family and friends of the firm owner to meet their financial needs (Allen et al., 2019; Nguyen et al., 2022).

The number of studies in the newly emerging literature examining how firms' financing expectations, preferences, and conditions changed after the COVID-19 pandemic has rapidly increased. Using firm-level survey data from the end of February to early April 2020 in the euro area, Ferrando and Ganoulis (2020) show that, although the expectations of both SMEs and large firms regarding bank loans and credit lines worsened during the pandemic, micro and small firms, in particular, had more positive conditional expectations about trade credits. Song et al. (2021) use loan-level data from China to investigate the effect of the pandemic on bank loans for small firms. They find that banks were more generous to small firms by giving more credits at lower cost and shorter maturity in places that were harder hit by the COVID-19 pandemic. These results indicate that expansionary monetary policy encourages banks to lend, thus keeping SMEs afloat. Liu et al. (2022) find that demand for loans by SMEs decreased significantly after the pandemic emerged in the Hubei Province, which is considered the origin of the pandemic, unlike SMEs in other provinces. This decline in credit applications is more notable among non-state-owned enterprises and those without prior bank relationships. Cowling et al. (2021) found that micro and small firms had the highest loan demand in the UK during the first two quarters of the COVID-19 outbreak. The loan rejection rate among small firms did not differ significantly compared to the pre-pandemic period. Another interesting finding shows that micro firms were more likely to receive government-guaranteed loans. The COVID-19 crisis has had a negative effect on the financial conditions in the real sector by narrowing not only the credit mechanism but also other alternative formal financing opportunities. For example, Brown et al. (2020) show that entrepreneurial finance deals for startups declined significantly in the United Kingdom during the pandemic.

It is important to stress that variations might occur among SMEs regarding access to finance and other financial conditions. For example, access to formal finance is expected to be more problematic for micro and small firms than for large and medium-size firms (Beck & Demirguc-Kunt, 2006; Beck et al., 2013). Therefore, micro and small firms might resort to informal financing channels more. With few exceptions (see, e.g., Cowling et al., 2012; Ferrando & Ganoulis, 2020), the empirical literature generally examines the effect of firm size on access to finance without examining micro and small firms separately. In our analysis, we divide SMEs into three categories: micro, small, and medium-size, to determine whether the results differ among SMEs.

Drawing on theory and the empirical literature, we propose the following hypotheses regarding the financial conditions and preferences of SMEs during the COVID-19 pandemic:

Hypothesis 1. SMEs are less likely than large firms to access formal finance opportunities. Micro and small firms have even less access.

Hypothesis 2. SMEs tend to rely on informal financing to meet their financing needs more than large firms. Micro and small companies are more dependent on informal finance than medium-size firms.

Hypothesis 3. SMEs tend to apply for credit less than large firms. Among credit applicants, SMEs are more likely to experience difficulty.

3. Data and methodology

Since the outbreak of the COVID-19 pandemic, some essential data, such as the results in the World Bank's World Enterprise Survey, have become even more important for capturing the effects on SMEs. Various case studies and surveys from different countries have also been instrumentalized, including those from China to the US and European countries. Surveys, therefore, are important data sources for understanding the real impact of the pandemic at the firm level. Using the World Bank Group's Business Pulse Survey on 51 countries in six regions during the first wave of the pandemic, Apedo-Amah et al. (2020) show in particular that small firms were cash trapped and liquidity concerns were more severe in terms of cash buffers as well as other financial constraints. Similarly, Bartik et al. (2020) find that small businesses were financially more fragile because of COVID-19-related disruptions. Thus, understanding the financial issues and coping strategies by SMEs to access finance is a key component of the surveys during the COVID-19 pandemic.

One of the most recent surveys by the European Union's (EU) Everywhere International SMEs (EIS) project, initially implemented before the pandemic, was extended to capture the impact of the COVID-19 outbreak on SMEs' internationalization in three channels: disruption in global supply chains, the

rising role of digitization in SMEs' internationalization to cope with the pandemic, and the general resilience of the international business ecosystem. The survey results demonstrate the impact channels of the crisis on the firms, particularly SMEs, their perception of policy measures as well as coping strategies. Furthermore, throughout the SME Envoys Network subgroup surveys, EU countries focus on the search for a more flexible yet diversified set of solutions to liquidity shortages as well as challenges in access to sustained finance.

The survey data collected for this study were made possible thanks to cooperation with the Istanbul Chamber of Commerce (ICOC), which has more than 600,000 member firms, of which around 420,000 are actively engaged in ICOC business activities. We were able to reach around 100,000 of them in the ICOC's database online and asked them to respond to our survey; 6030 firms partially responded and 3493 fully responded to the survey. Considering that the possible effects of COVID-19 on the firm size preferences of entrepreneurs when establishing new companies would bias our results, in this paper, we include only firms that were established before the pandemic. As a result, our paper analyzes the survey responses from 2983 firms.

The data gathered through a jointly designed survey carried out among the ICOC member firms is unique in the Turkish and even the emerging market economies context because the ICOC is the best representative of Türkiye's largest industrial and commercial city, Istanbul, which is home to more than 16 million people, corresponding to around 20 percent of the country's total population. Istanbul generates more than 30 percent of Türkiye's GDP, some 54 percent and 51 percent of the country's imports and exports, respectively; more than 40 percent of the country's tourism revenue; more than 20 percent of the labor force; and 45 percent of the tax revenue. Istanbul also comprises some 25 percent of consumer expenditure as well as around 15 percent of the central government investment expenditure.

Table 2
Description of dependent variables.

Variable Name	Survey Question/Description	Specification
No Cash Problem	Through which channels did you meet your financing needs as a company during the pandemic period? Answer: Did not experience any cash flow problems. Yes/No A dummy variable equals to 1 if the answer is 'Yes', 0 otherwise	Table 4 Table 5 Table 6
Credit Restructuring	Through which channels did you meet your financing needs as a company during the pandemic period? Answer: Restructured our old bank loan Yes/No A dummy variable equals to 1 if the answer is 'Yes', 0 otherwise	Table 4 Table 5 Table 6
Debt Postponing	Through which channels did you meet your financing needs as a company during the pandemic period? Answer: Agreed with the lenders and postponed our debt Yes/No A dummy variable equals to 1 if the answer is 'Yes', 0 otherwise	Table 4 Table 5 Table 6
Informal Credit	Through which channels did you meet your financing needs as a company during the pandemic period? Answer: Borrowed from acquaintance Yes/No A dummy variable equals to 1 if the answer is 'Yes', 0 otherwise	Table 4 Table 5 Table 6
New Banking Credit	Through which channels did you meet your financing needs as a company during the pandemic period? Answer: Getting a new bank loan Yes/No A dummy variable equals to 1 if the answer is 'Yes', 0 otherwise	Table 4 Table 5 Table 6
Capital Injection	Through which channels did you meet your financing needs as a company during the pandemic period? Answer: Increased our company's equity through capital injection Yes/No A dummy variable equals to 1 if the answer is 'Yes', 0 otherwise	Table 4 Table 5 Table 6
Cost Reductions	Through which channels did you meet your financing needs as a company during the pandemic period? Answer: Reduced operation costs Yes/No A dummy variable equals to 1 if the answer is 'Yes', 0 otherwise	Table 4 Table 5 Table 6
Credit Application	Did you experience any difficulties (extension of your loan approval, rejection of your application, request for collateral beyond normal conditions, etc.) in the approval of your loan application during the pandemic period? Answer: Did not apply for a loan A dummy variable equals to 1 if the answer is "Did not apply for a loan", 0 otherwise	Table 7
Credit Application Difficulty	Did you experience any difficulties (extension of your loan approval, rejection of your application, request for collateral beyond normal conditions, etc.) in the approval of your loan application during the pandemic period? Answer: Yes/No (Among applicants) A dummy variable equals to 1 if the answer is "Yes", 0 otherwise	Table 7

The survey was conducted and finalized between May 11 and June 2, 2021, the period of the most severe waves of COVID-19 in Türkiye. During this period, the country experienced long-lasting closures by public utilities, including transportation, bans on international and interurban travel, strictly regulated and limited business activities, and tight health restrictions, followed by a gradual opening in social and economic life.

Firms that are members of the chamber are predominantly SMEs, as the survey results reflect. The survey is designed to capture the firms' assessment of the economic impact of the COVID-19 pandemic and the precautionary measures taken and the effect on their own performance of economic policies implemented by the government. Questions aimed to measure the economic impact of the COVID-19 pandemic while also asking about the coping strategies by the respondent firms. Survey questions were intended to reveal how the firms perceived their current status concerning supply- and demand-side factors as well as future expectations on overall business conditions.

To capture the financial conditions and opportunities for firms, the survey poses questions about how firms met their financial needs during the pandemic and their experience in

Table 3
Description of independent variables.

Variable Name	Survey Question/Description	Specification
Micro	Number of employees at the end of 2019	Table 4
	Answer: 1–9; 10–49; 50–249; 250+	Table 5
	A dummy variable equals to 1 if the answer is '1–9', 0 otherwise	Table 6
		Table 7
Small	Number of employees at the end of 2019	Table 4
	Answer: 1–9; 10–49; 50–249; 250+	Table 5
	A dummy variable equals to 1 if the answer is '10–49′, 0 otherwise	Table 6
		Table 7
Medium	Number of employees at the end of 2019	Table 4
	Answer: 1–9; 10–49; 50–249; 250+	Table 5
	A dummy variable equals to 1 if the answer is '50–249, 0 otherwise	Table 6
		Table 7
Firm age	How long has your company been operating?	Table 4
	Firm age = (2021 – Year of Establishment)	Table 5
	Natural logarithm of firm age	Table 6
		Table 7
Export	Does the company export?	Table 4
	Answer: Yes/No	Table 5
	A dummy variable equals to 1 if the answer is 'Yes', 0 otherwise	Table 6
		Table 7
Joint-stock	Type of the company	Table 4
	Answer: Joint-stock, Unlimited liability, Limited partnership, Limited company, Cooperative,	Table 5
	A dummy variable equals to 1 if the answer is 'Joint-stock', 0 otherwise	Table 6
		Table 7
Unlimited liability	Type of the company	Table 4
	Answer: Joint-stock, Unlimited liability, Limited partnership, Limited company, Cooperative,	Table 5
	A dummy variable equals to 1 if the answer is 'Unlimited liability', 0 otherwise	Table 6
		Table 7
Limited partnership	Type of the company	Table 4
	Answer: Joint-stock, Unlimited liability, Limited partnership, Limited company, Cooperative,	Table 5
	A dummy variable equals to 1 if the answer is 'Limited partnership', 0 otherwise	Table 6
		Table 7
Cooperative	Type of the company	Table 5
	Answer: Joint-stock, Unlimited liability, Limited partnership, Limited company, Cooperative,	Table 6
	A dummy variable equals to 1 if the answer is 'Cooperative', 0 otherwise	Table 7
Manufacturing	Main field of activity	Table 5
	Answer: Manufacturing, Construction, Commerce, Services	Table 6
	A dummy variable equals to 1 if the answer is "Manufacturing", 0 otherwise	Table 7
Construction	Main field of activity	Table 5
	Answer: Manufacturing, Construction, Commerce, Services	Table 6
	A dummy variable equals to 1 if the answer is "Construction", 0 otherwise	Table 7
Commerce	Main field of activity	Table 5
	Answer: Manufacturing, Construction, Commerce, Services	Table 6
	A dummy variable equals to 1 if the answer is "Commerce", 0 otherwise	Table 7
Covid-effect	"How much has your company and business environment been affected by the COVID-19 outbreak?"	Table 6
	Answer: 1 'very positively affected' to 5 'very negatively affected'.	Table 7
Layoff-Lockdowns	Has your company had to suspend its activities due to the restrictive measures taken during the epidemic?	Table 6
	Answer: Yes/No	Table 7
	A dummy variable equals to 1 if the answer is 'Yes', 0 otherwise	

accessing credit. The focal point of this study, therefore, is to assess the presence of any financial problems, firms' approaches to problems, and financing methods/channels. These questions were used to construct the dependent variables. Table 2 describes the dependent variables in detail. Although 39.73 percent of the firms secured new banking credit, 37.95 percent reduced their operating costs. Not surprisingly, the share of firms that obtained the much-needed cash from their acquaintances is also relatively high (36.47%), making informal finance one of the most used methods of accessing finance. At least 19.28 percent of the firms deferred their outstanding debt, with the approval of their creditors; around 13 percent restructure old loans, and 6.2 percent raised their own equity through capital injection. Interestingly, 13.14 percent of the firms said that they were not in financial straits during the pandemic, and 66.4 percent of the respondents who applied for new banking credit stated that they encountered various difficulties during the application process.

Following the previous literature, as empirical specifications, we include various independent variables to control for firm characteristics, such as firm age, legal status (limited or partnership), and industrial sector. Table 3 gives detailed information about the independent variables. The basic descriptive statistics related to the survey reveal that around 43.98 percent of the respondent firms operate in the services, followed by some 27.66 percent in commercial business and 22.9 percent in the manufacturing with respect to their core businesses. Construction firms make up 5.46 percent of our sample. With regard to the type of company, the firms are overwhelmingly limited liability companies (70.1 percent) and stock corporations (22.06 percent), whereas collective or limited partnership companies constitute a small portion of our sample (4.12% and 3.49%, respectively). Finally, cooperatives make up only 0.23 percent of the respondent firms. The firms are mainly SMEs, among which 67.01 percent are micro enterprises. Small enterprises make up around 23.63 percent of the sample, and 7.11 percent consider themselves medium-size enterprises. Large firms comprise only 2.25 percent of the sample.

To test our main argument regarding the effect of firm size on firms' financial conditions and behavior during COVID-19, we use the following main regression:

$$Finance_i = \alpha + \beta_1 Micro_i + \beta_2 Small_i + \beta_3 Medium_i + \gamma Firmcontrol_i' + \delta Industry + \theta District + \varepsilon_i \quad (1)$$

where *Finance* is a binary dependent variable for the financial behavior and conditions of firm *i*. *Micro*, *Small*, and *Medium* are dummy variables that take a value of 1 for a micro (small or medium-size) firm, and 0 otherwise. Firmcontrol denotes a vector of firm characteristics. *Industry* and *District* are sets of dummy variables for industries and districts to control for industry- and district-fixed effects. To correct for any potential correlation of individual errors at the industry level, standard errors are adjusted for clustering at the industry level in all regressions.

We use a logit model to estimate Equation (1). Using the ordinary least squares (OLS) technique to estimate a model with a binary dependent variable can produce inefficient estimators (Greene, 2008; Wooldridge, 2009). First, the error term depends on the value of the independent variables, meaning that results might suffer from heteroskedasticity. Second, the error term is not normally distributed, implying that the tests of the hypotheses might be invalid. Third, the predicted probabilities produced by OLS can be less than 0 and greater than 1, meaning that the basic law of probability might be violated. Therefore, to achieve more reliable results, our regressions are estimated using a logit model. One alternative model is to use a probit model, which yields similar results.[1]

4. Empirical results

The results in Table 4 come from the most parsimonious specification, which does not include any control variables other than firm-size dummies. Column (1) shows that micro and small firms are more likely to experience financial problems during the COVID-19 pandemic. The estimated coefficients of micro and small firms are statistically significant at the 1 percent level. The results indicate that, unlike large firms, medium-size companies experiencing financial problems do not experience financial conditions that significantly differ statistically. The results in Columns (2), (5), and (6) show that micro firms are less likely to restructure their debt, obtain new bank debt, and inject capital into their firm than large firms. These effects are highly significant for micro firms. Column (4) shows that micro and small firms are more likely to borrow money from their acquaintances, such as friends and relatives, to meet their financial needs. Column (7) demonstrates no significant differences across firms of different sizes in terms of cost reduction to meet financial needs. The initial results also show that although medium-size firms are more likely to obtain new bank credit, they have a lower probability than large firms of postponing debt repayment and obtaining informal credit. These effects are statistically significant at conventional rates.[2]

Next, in Table 5, we add some firm characteristics, such as age, whether the firm is an exporter, and the type of ownership, along with industry dummies, and district dummies to check whether our results are robust to controlling for other relevant and standard control variables used in similar firm-level empirical studies. Then, Table 6 shows the empirical results after the perceived and real effects of the COVID-19 pandemic on firms are added. The question "How much has your company and business environment been affected by the COVID-19 outbreak?" is used to measure the perceived COVID-19 effect (*Covid-effect*). This is a Likert-type question, with responses scored from 1 (affected very positively) to 5 (affected very negatively). To check the real effect of COVID-19 on

[1] To conserve space, we provide only the logit results, but the probit results are available from the authors upon request.

[2] In Table 4, the pseudo R^2 values are low because we do not add any firm-level characteristics and industry-level controls into the specification. When we include a large amount of control variables to the model, as seen in other tables (Tables 5–7), R^2 increases significantly and becomes consistent with that in other articles (see Beck et al., 2005, 2013). Because it is more difficult to control all relevant variables in micro-level empirical studies, R^2 is generally lower than in macro studies.

Table 4
Main Results without any Control.

	No Cash Problem (1)	Credit Restructuring (2)	Debt Postponing (3)	Informal Credit (4)	New Banking Credit (5)	Capital Injection (6)	Cost Reductions (7)
Micro	−1.291*** (0.286)	−0.463** (0.188)	0.426 (0.476)	1.153*** (0.169)	−0.506*** (0.161)	−0.788*** (0.240)	0.311 (0.218)
Small	−0.837** (0.392)	−0.038 (0.346)	0.390 (0.306)	0.666*** (0.111)	−0.069 (0.105)	−0.256 (0.620)	0.295 (0.197)
Medium	−0.043 (0.662)	−0.276 (0.313)	−0.954** (0.383)	−2.700*** (0.851)	0.407*** (0.052)	−0.362 (0.510)	0.056 (0.206)
No of obs.	2983	2983	2983	2983	2983	2983	2983
Pseudo R^2	0.029	0.006	0.005	0.030	0.010	0.011	0.001

Note: Standard errors are clustered at the industry level. ***, ** and * denote statistically significant at the 1 percent, 5 percent, and 10 percent, respectively. *Finance* is a binary type of dependent variable on financial behavior and conditions of firm i. *Micro*, *Small*, and *Medium* are dummy variables that take the value 1 if a firm is micro (small or medium) and 0 otherwise.

firms, we add a dummy variable (*Layoff-Lockdowns*) and pose the following question: "Has your company had to suspend its activities due to the restrictive measures taken during the epidemic?" to which the response can be 1 (yes) or 0 (no). Including all these variables in the regression causes minor changes in the main results. In the specification with the COVID-19 impact, firm size loses its significance in determining the probability of having cash problems. With respect to cost reductions, the estimated coefficient on *Small* gains some significance, implying that small firms are more inclined to reduce costs to create some additional space for financial needs. Other results about firm size are the same as the initial results.

The results in Table 6 indicate that being a micro firm reduces the probability of credit restructuring, new bank credit, and capital injection by 6.4, 17.2, and 3.4 percent, respectively, and increases the likelihood of reporting a cost reduction during the pandemic by 8.5 percent compared over that of large firms. The estimated coefficient of *Micro* (*Small*) in Column (4) of Table 6 shows that being a micro (small) firm increases the probability of borrowing money from an acquaintance by 14.1 (8.4) percent over that of a large firm. However, being a medium-size firm decreases the probability of credit from acquaintances by 57 percent over that of a large firm. In Column (5) of Table 5, medium-size firms are more likely than large firms to obtain new banking credit during the pandemic by 10.6 percent. Empirical findings are largely consistent with H1 and H2. At this point, micro firms are negatively differentiated in terms of access to formal finance channels, whereas medium-size companies are positively differentiated.

Tables 5 and 6 have interesting and important results on firm- and industry-based impacts. The results reveal that older firms and exporters are less likely to experience cash problems during the pandemic. Although firms in commercial and manufacturing sectors report fewer cash problems than those in the services, the probability of having a cash problem is higher for construction firms. Manufacturers are more likely than firms in the service sector to access both formal and informal financing channels. Because construction companies have more problems in accessing both formal and informal finance, they have a greater tendency to postpone repayment of their debt, restructure loans, and reduce their costs than firms in the service sector. Commercial firms are more inclined to secure credit from formal and informal channels and to inject capital, but they are less likely to restructure outstanding loans and reduce their costs. Exporters are less likely to postpone repayment of debt and obtain new bank credit but more likely to inject capital. Türkiye's export performance gained momentum after the first wave of the COVID-19 pandemic, so it is not surprising that exporters tend to prefer options such as delaying repayment of debt and bank credit less and strengthen their capital structure with export revenue. Firms at which the COVID-19 pandemic negatively affected business operations and temporarily suspended activity during the lockdowns are more likely to report cash problems, delay debt repayment, and receive funding from acquaintances. Firms that perceive the effects of COVID-19 on firms positively tend to inject capital and use trade credit more than others. These firms are less likely to restructure their debt and reduce their costs to meet their financial needs during the pandemic.

To test H3, first, we regress firm size dummies and other control variables on a binary dependent variable that takes a value of 1 if firms report that they applied for bank credit during the pandemic; then, among credit applicants, we use another binary dependent variable that takes a value 1 if applicant firms report any difficulty (e.g., extension of the loan approval period, rejection of the application, request for more collateral beyond normal conditions) in accessing credit. These results are shown in Table 7. The results in Column (3) show that although micro and small firms are less likely than large firms to apply for bank credit, medium-size firms are more eager to do so. The estimated coefficients are statistically significant and economically meaningful. Being a micro (small) firm reduces the likelihood of applying for bank credit by 20.2 percent (4.9 percent) of that of large firms. However, being a medium-size firm increases this probability by 22.4 percent. The results in Column (6) indicate that micro and small firms are more likely than large firms to report difficulty in applying for bank credit by 11.7 and 10.1 percent, respectively.

The Turkish economy showed unique resilience and rapid recovery after the first two waves of the COVID-19 pandemic. The increase in exports to Europe and the US as a result of the tight supply chains in Asia and the increase in transportation costs from Asia to Europe and the US, as well as high domestic demand, thanks to the expansion in consumer loans, increased the profitability of large manufacturing firms to record levels. Because the Borsa Istanbul (Istanbul Stock Exchange) had many new domestic investors during the pandemic, it broke some records, which was financially beneficial for many large

Table 5
Controlling for firm and industry characteristics, and district fixed effects.

	No Cash Problem (1)	Credit Restructuring (2)	Debt Postponing (3)	Informal Credit (4)	New Banking Credit (5)	Capital Injection (6)	Cost Reductions (7)
Micro	−0.822*** (0.293)	−0.467** (0.210)	0.165 (0.475)	0.782*** (0.147)	−0.625*** (0.160)	−0.759*** (0.256)	0.381** (0.178)
Small	−0.550 (0.404)	−0.021 (0.345)	0.255 (0.341)	0.427*** (0.107)	−0102 (0.089)	−0.263 (0.589)	0.309 (0.196)
Medium	−0.118 (0.710)	−0.267 (0.276)	−0.867* (0.452)	−2.636*** (0.983)	0.411*** (0.065)	−0.383 (0.543)	0.061 (0.238)
Firm age	0.228** (0.085)	0.070 (0.072)	−0.237*** (0.031)	−0.270*** (0.040)	−0.024 (0.026)	−0.196*** (0.074)	0.030 (0.072)
Export	0.449*** (0.107)	−0.074 (0.126)	−0.196*** (0.054)	−0.208* (0.109)	−0.191** (0.067)	0.220*** (0.075)	−0.052 (0.111)
Joint-stock	0.449*** (0.091)	−0.112 (0.079)	−0.134 (0.128)	−0.555*** (0.100)	−0.026 (0.053)	0.170** (0.076)	−0.061** (0.027)
Unlimited liability	−0.453*** (0.161)	0.508** (0.247)	0.182 (0.233)	−0.073 (0.067)	0.555*** (0.143)	−1.296*** (0.368)	−0.240 (0.160)
Limited partnership	−0.628 (0.400)	−0.382*** (0.073)	−0.418 (0.400)	−0.132 (0.083)	0.379* (0.230)	−0.640 (0.714)	0.134 (0.225)
Cooperative	1.370 (0.870)	–	–	–	−1.111 (1.072)	–	−0.350* (0.210)
Manufacturing	−0.156 (0.099)	−0.089 (0.070)	−0.029 (0.075)	0.093 (0.080)	0.210*** (0.035)	0.079 (0.080)	−0.210*** (0.047)
Construction	−0.457*** (0.030)	0.210*** (0.013)	0.192*** (0.061)	0.470*** (0.036)	−0.197*** (0.043)	0.066* (0.035)	0.092*** (0.023)
Commerce	0.200*** (0.051)	−0.168*** (0.048)	−0.093 (0.057)	−0.038 (0.032)	0.092** (0.044)	0.182*** (0.031)	−0.394*** (0.018)
District Fixed Effect	YES	YES	YES	YES	YES	YES	YES
No of obs.	2970	2975	2971	2975	2982	2883	2892
Pseudo R^2	0.076	0.021	0.031	0.068	0.024	0.050	0.019

Note: Standard errors are clustered at the industry level. ***, ** and * denote statistically significant at the 1 percent, 5 percent and 10 percent, respectively. *Finance* is a binary type of dependent variable on financial behavior and conditions of firm i. *Micro*, *Small*, and *Medium* are dummy variables that take the value 1 if a firm is micro (small or medium) and 0 otherwise. *Firmcontrol'* denotes for a vector of firms' characteristics. *Industry* and *District* are sets of dummy variables for industries and district to control for industry and district fixed effects.

Table 6
Controlling for COVID-19 impact.

	No Cash Problem (1)	Credit Restructuring (2)	Debt Postponing (3)	Informal Credit (4)	New Banking Credit (5)	Capital Injection (6)	Cost Reductions (7)
Micro	−0.437 (0.362)	−0.629*** (0.207)	0.022 (0.458)	0.648*** (0.142)	−0.722*** (0.155)	−0.699*** (0.252)	0.362** (0.165)
Small	−0.479 (0.473)	−0.085 (0.337)	0.194 (0.348)	0.378*** (0.128)	−0.139 (0.103)	−0.246 (0.588)	0.303 (0.192)
Medium	−0.253 (0.753)	−0.231 (0.247)	−0.829* (0.500)	−2.584** (1.074)	0.445*** (0.039)	−0.408 (0.513)	0.065 (0.244)
Covid-effect	1.009*** (0.057)	−0.534*** (0.048)	−0.394*** (0.106)	−0.491*** (0.055)	−0.324*** (0.019)	0.303** (0.121)	−0.170*** (0.041)
Layoff-Lockdowns	−1.009*** (0.188)	0.313 (0.222)	0.428*** (0.156)	0.494*** (0.024)	0.061 (0.150)	−0.005 (0.200)	−0.124 (0.111)
Firm age	0.190* (0.095)	0.110* (0.063)	−0.210*** (0.034)	−0.245*** (0.048)	−0.007 (0.028)	−0.214*** (0.072)	0.035 (0.070)
Export	0.319*** (0.092)	0.148 (0.124)	−0.122*** (0.046)	−0.121 (0.136)	−0.148** (0.043)	0.178* (0.100)	−0.042* (0.107)
Joint-stock	0.402*** (0.124)	−0.049 (0.090)	−0.100 (0.136)	−0.537*** (0.101)	0.006 (0.050)	0.133* (0.077)	−0.050* (0.029)
Unlimited liability	−0.854*** (0.133)	0.530** (0.247)	0.185 (0.245)	−0.055 (0.090)	0.589*** (0.163)	−1.370*** (0.406)	−0.225 (0.162)
Limited partnership	−0.399 (0.410)	−0.420*** (0.090)	−0.464 (0.400)	−0.190* (0.103)	0.361 (0.232)	−0.612 (0.720)	0.132 (0.222)
Cooperative	1.363** (0.525)	–	–	–	−1.092 (0.940)	–	−0.337* (0.180)
Manufacturing	−0.309*** (0.072)	−0.012 (0.068)	0.034 (0.084)	0.174** (0.085)	0.262*** (0.037)	0.043 (0.105)	−0.188*** (0.046)
Construction	−0.464*** (0.079)	0.190*** (0.021)	0.167*** (0.070)	0.457*** (0.040)	−0.207*** (0.039)	0.047 (0.035)	0.100*** (0.028)
Commerce	0.187*** (0.030)	−0.116*** (0.059)	−0.069 (0.056)	−0.007 (0.030)	0.129** (0.056)	0.148** (0.058)	−0.371*** (0.020)
District Fixed Effects	YES	YES	YES	YES	YES	YES	YES
No of obs.	2970	2975	2971	2975	2982	2883	2892
Pseudo R^2	0.232	0.046	0.052	0.101	0.035	0.058	0.021

Note: Standard errors are clustered at the industry level. ***, ** and * denote statistically significant at the 1 percent, 5 percent and 10 percent, respectively. *Finance* is a binary type of dependent variable on financial behavior and conditions of firm i. *Micro, Small*, and *Medium* are dummy variables that take the value 1 if a firm is micro (small or medium) and 0 otherwise. *Firmcontrol'* denotes for a vector of firms' characteristics. *Industry* and *District* are sets of dummy variables for industries and district to control for industry and district fixed effects.

Table 7
Results for credit applications.

	Credit Application			Credit Application Difficulty		
	(1)	(2)	(3)	(4)	(5)	(6)
Micro	−0.478*** (0.084)	−0.697*** (0.025)	−0.865*** (0.053)	0.958*** (0.284)	0.717*** (0.275)	0.521** (0.240)
Small	−0.030 (0.036)	−0.139** (0.064)	−0.210*** (0.074)	0.644*** (0.137)	0.507*** (0.129)	0.450*** (0.153)
Medium	0.833** (0.390)	0.905** (0.373)	0.958*** (0.309)	−0.346 (0.241)	−0.273 (0.250)	−0.255 (0.260)
Covid-effect			−0.371*** (0.057)			−0.622*** (0.029)
Layoff-Lockdowns			0.234 (0.232)			0.466*** (0.057)
Firm age		−0.207*** (0.034)	−0.187*** (0.031)		−0.319*** (0.023)	−0.285*** (0.029)
Export		−0.199 (0.147)	−0.140 (0.115)		−0.109** (0.030)	0.015 (0.039)
Joint-stock		−0.080 (0.070)	−0.045 (0.068)		−0.091 (0.076)	−0.002 (0.108)
Unlimited liability		0.386*** (0.112)	0.432*** (0.143)		−0.216 (0.222)	−0.129 (0.217)
Limited partnership		0.449*** (0.199)	0.417** (0.200)		−0.568* (0.327)	−0.581* (0.342)
Cooperative		–	–		–	–
Manufacturing		0.281*** (0.070)	0.344*** (0.066)		−0.087 (0.080)	0.046 (0.091)
Construction		0.259*** (0.023)	0.247*** (0.028)		0.249*** (0.050)	0.403*** (0.065)
Commerce		0.033 (0.026)	0.065*** (0.020)		−0.254*** (0.034)	−0.200** (0.025)
District Fixed Effect	NO	YES	YES	NO	YES	YES
No of obs.	2983	2975	2975	1839	1837	1837
Pseudo R^2	0.011	0.033	0.052	0.020	0.059	0.107

Note: Standard errors are clustered at the industry level. ***, ** and * denote statistically significant at the 1 percent, 5 percent and 10 percent, respectively. *Finance* is a binary type of dependent variable on financial behavior and conditions of firm i. *Micro*, *Small*, and *Medium* are dummy variables that take the value 1 if a firm is micro (small or medium) and 0 otherwise. *Firmcontrol'* denotes for a vector of firms' characteristics. *Industry* and *District* are sets of dummy variables for industries and district to control for industry and district fixed effects.

firms, enabling them to afford the increasing production and transportation costs and to engage in new investment. Therefore, many large firms may have unexpectedly decreased dependence on bank loans during that period. However, medium-size companies that wanted to take advantage of the economic opportunities presented by the reopening of the economy after the waves of the pandemic applied for more loans to expand business. At the same time, micro and small firms borrowed more from acquaintances in order to meet financing needs that arose during the pandemic.

5. Discussions

Economic shocks can have a more negative impact on SMEs than large firms, damaging business/market dynamism cyclically and structurally. In this respect, the COVID-19 pandemic, an external shock that damaged economic activity through multiple channels, was a critical test for SMEs. As in many crisis periods, during COVID-19 access to finance was one of the most challenging factors for SMEs. Financial difficulties are often more decisive for SMEs in EM, where financial markets are relatively shallow. This article empirically examines the differences in the financial conditions and behavior of firms of different sizes during the COVID-19 pandemic in Istanbul, which is both a regional business hub and the economic heart of Türkiye, an emerging market with critical importance for the global economy.

This paper hypothesizes that although SMEs are less likely to access finance from banks and other financial institutions, they are more likely to rely on informal finance to survive and float their business during the various waves of the pandemic. In addition, this paper also hypothesizes that SMEs are discouraged when applying for credit and face more difficulty than large firms in credit applications.

Not surprisingly, in line with previous literature, the results show that micro and small firms are less likely to receive new bank credit, but this effect is significant only for micro firms. Our contribution to the literature is the use of more information about the financial conditions and behavior of firms through surveying them about their conditions, such as debt restructuring, delaying debt repayment, injecting capital, and reducing costs during the pandemic. Our empirical results show that micro firms tend to restructure loans and inject capital significantly less than large firms. Consistent with the previous literature, our empirical results conclude that micro and small firms meet their financial needs by borrowing funds from acquaintances more than large firms.

According to the empirical results, which differ from the literature in some respects, compared to large firms, medium-size firms did not experience significant difficulty in accessing credit during the pandemic. On the contrary, they are more inclined to obtain more credit. This situation has two different cause. First, the Turkish government preferred to provide more credit through public banks, rather than using fiscal policy tools to mitigate the effects of the pandemic on the real sector. This credit was primarily targeted at SMEs. Medium-size firms with a longer or better credit history and more collateral opportunities among SMEs had more access to this targeted credit. The second reason might be related to the emerging commercial opportunities for medium-size firms and the corresponding need for increases in capacity. During COVID-19, they gained new export opportunities, especially to Europe and the US, because of the supply disruptions and logistics cost increases, especially in East Asia. Medium-size firms might have applied

for and accessed more credit to finance their new investment, as they increased their ability to satisfy the increasing export orders and the need for more domestic products in the domestic market (Delgado et al., 2022). Our empirical results confirm this potential explanation.

Medium-size firms tend to apply for credit more, but, compared to large firms, do not face significant difficulty in their credit applications. At the same time, the results confirm "the discouraged borrower" hypothesis for micro and small firms. They are significantly less inclined to apply for credit (Disli et al., 2022). In addition, among credit applicants, they face more difficulty.

6. Conclusion

SMEs are the backbone of the real economy. When economic conditions and the business environment are too suffocating for SMEs, the competition that triggers innovation is eroded, fewer jobs are created, and the wheels of economic growth slow down. Although SMEs play such a critical role in the economy, crisis periods can be extremely challenging for SMEs, especially in financing channels. The COVID-19 pandemic, in which different demand- and supply-side shocks hit the real economy simultaneously, was even more arduous for SMEs. EMs, where financial markets are shallower, monetary and fiscal policies have less room for maneuver, and macroeconomic stability is weaker, pose additional challenges to SMEs in such a period. Understanding the financial conditions and behavior of SMEs is vital for EMs if they are to cope with destructive economic shocks more resiliently. The paper lays out the differences in financing conditions and behavior among firms based on their size during the COVID-19 pandemic in an EM. We collected survey data from Turkish firms that are members of the ICOC, one of the biggest in the broader Middle Eastern and North African region, as well as among its European peers. Our empirical results show that micro and small firms face more financial problems and have less access to formal financing channels than large firms. As a reflection of this situation, micro and small firms finance their business operations through informal financing. They tend to borrow more from their acquaintances, rather than from formal credit channels in the banking industry. But medium-size firms have not experienced significant difficulty in accessing formal financing opportunities. They are more inclined than large firms to apply for and take out bank loans.

The empirical results offer policy makers clarity about these issues. Policy makers should focus even more on the financial restrictions on micro firms during the COVID-19 pandemic. Undoubtedly, integrating SMEs into the formal banking sector on a regular basis and improving their transparency help economies remain resilient in challenging times. Additionally, the findings highlight the importance of informal lending channels for micro firms and show policy makers and businesses the value of enhancing the social capital of SMEs. The findings also point out market opportunities for banks and other companies in the financial sector while revealing that micro firms still have untapped potential. Technological resources from fintech could help banks reach a larger audience. In sum, the banking industry has the potential to benefit from fintech resources (Nanaeva et al., 2021) and reach a wider group of SMEs with low operating costs and contribute to resilience and social well-being.

The outbreak of COVID-19 was a period in which the credit mechanism was kept alive thanks to the decline in interest rates and credit guarantees. In terms of the size of the support differentiated this period from the 2008 GFC. Because the real sector received generous support through monetary and fiscal policy channels, medium-size firms with high collateral and a good credit history did not experience more difficulty than large firms in accessing finance. Therefore, when the credit mechanism is supported by both monetary and fiscal policies, it would be better for policy makers to monitor not only access to credit but also whether credit is directed to the right sectors. Policy makers should implement macroprudential policies to ensure that credit goes to medium-size firms in promising sectors with export potential.

This paper has certain limitations. First, the survey was only performed during the pandemic period and has not been repeated. No prior survey was conducted with similar questions. Hence, it is difficult to compare the results over time. Moreover, during the pandemic, many policy measures were implemented over a short period, which also limits the interpretations about which policies worked better than others. This period featured not only with high global uncertainty but also high domestic uncertainty mostly due to increasing inflation and exchange rate volatility. It is difficult to capture both global and domestic uncertainty in a single study. These limitations require future research.

In future research, similar surveys need to be repeated over time to capture the behaviors of SMEs better. Policies implemented by the government during the pandemic could be assessed in terms of their implications for SMEs. In particular, which kinds of policies adopted by the government were more effective for different types of firms matters for their employment implications. Another future study could be about the financialization of SMEs during the COVID-19 period. The policy measures implemented during COVID-19 might have even led to further financialization of SMEs and could pose greater challenges in the future. Another dimension could be an analysis of the resistance to change at SMEs (Manisaligil et al., 2023). Certainly, in terms of finding solutions to SME financing, one could also investigate the role of fintech companies (Unal & Aysan, 2022). This paper is a good basis for future studies and will be useful for policy makers and the SMEs to help them become more resilient to future shocks.

Declaration of competing interest

None of the authors has any financial and personal relationships with other people or organizations that could inappropriately influence (bias) our work.

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