TRADE CREDIT BORROWING IN FAMILY FIRMS IN BIST: A PANEL REGRESSION APPROACH[1] [2]

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ABSTRACT |

The finance literature presents credit purchases as an important source of funding to buyers. It has even been demonstrated to be in use in financing physical investments. Some studies argue that managers, concerned with wealth maximization should, in fact, finance physical investments via trade credit because it limits the use of funds for private benefits and hence reduces agency costs. Accordingly, the aim of this study is to examine financing preferences toward trade credit borrowing in family firms, using publicly traded firm data from Turkey. We also examine its use in financing capital expenditures by comparing family and non-family firms. The sample includes 173 non-financial firms and covers the period 2006-2019. The comparison of family and non-family firms reveals no significant differences in the use of trade credit, however, a negative and statistically significant association between investment and the usage of trade credit is found.

Keywords: Capital structure, credit sales, family business
JEL Codes: G01, G30, G31

Scope: Business administration
Type: Research

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[1] It has been declared that this study complies with the ethical rules.

[2] The findings of this study have been presented in 9th Family Business Congress.

BIST AİLE İŞLETMELERİNDE TİCARİ BORÇ YÖNETİMİ: PANEL REGRESYON YAKLAŞIMI

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ÖZ | Ticari borç literatürü, kredili mal alışlarının işletmeler için önemli bir finansman aracı olduğunu ortaya koymuştur. Yakın zamanda yapılan bazı çalışmalar ise ticari borçların fiziksel kapasite artışlarının finansmanında önemli bir araç olduğunu dile getirmiştir. Öyle ki, kaynakların etkin kullanımını ve firmanın değerini maksimize etmeyi hedefleyen yöneticilerin finansman tercihlerini ticari borçlardan yana kullanacağı, zira böyle bir uygulamanın kaynak israfını engelleyeceğini dolayısıyla asil-vekil ilişkisinden kaynaklı maliyetleri düşüreceği dile getirilmiştir. Bu çalışmanın amacı Borsa İstanbul'a kayıtlı aile şirketlerinin sermaye yapısını ve bu işletmelerin fiziksel yatırımlarında kullanılan ticari borç miktarının diğer firmalara nazaran nasıl farklılaştığını incelemektir. Çalışmada Borsa İstanbul'da işlem gören 173 işletmenin 2006-2019 yıllarına ait verileri panel regresyon yöntemi ile incelenmiştir. Elde edilen bulgular ticari borç kullanımında önemli bir farklılık olmadığına işaret etse de aile şirketlerinin fiziksel yatırımların finansmanında belirgin şekilde daha az ticari borç kullandıkları anlaşılmıştır.

Anahtar Kelimeler: Sermaye yapısı, kredili satışlar, aile şirketleri
JEL Kodları: G01, G30, G31

Alan: İşletme
Tür: Araştırma

1. INTRODUCTION

Firms take advantage of trade debt as a source of liquidity when they make credit purchases from suppliers[3]. The practice involves the seller providing goods and services on time and, in return, the buyer makes delayed payment on an agreed-upon date. Proportionally, it constitutes the second-most important external source of funding. For example, the descriptive statistics in Table 1 indicate that an average publicly traded firm in Turkey finances 13% of its assets via credit from its suppliers.

Trade credit (hereafter TC) is an alternative source of funding and is generally preferred by managers looking out for their shareholders' best interests (Aktaş, de Bodt, Lobez & Statnik, 2012, p. 1404) and, in fact, existing studies have repeatedly shown that the use of TC leads to significant performance improvement in several dimensions (e.g., Goto, Xiao & Xu, 2016, p. 297). In other words, the choice of financing, i.e., TC from suppliers, banks loans etc. as a set of strategic decisions directly affect firm value. Naturally, one would expect to see increased usage of such sources in funding operations which promote growth and profitability.

On the other hand, in another branch of the literature, traditional agency theory, concerned with ownership structure and its managerial consequences, suggests that the presence of a large shareholder, as in the case of family companies, will encourage the management to be extremely vigilant when it comes to operationalizing firms' resources (Din, Khan, Khan & Khan, 2021, p. 3). For example, a vigilant manager is more likely to prefer TC over cash credits obtained from financial institutions because it comes in the form of inventory and limits exploitation of resources (Aktas et al., 2012). According to this intuition, family firms, which are less likely to suffer from agency cost,[4] should be taking advantage of it to a greater extent. However, this subject has not been examined previously, and the reason why firms do not employ more TC is a question currently left unanswered.

To fill this gap in the literature, the TC policies of publicly traded family companies listed in the Borsa Istanbul Stock Exchange (BIST) are explored in comparison to those of non-family firms, using the OLS panel regression and dynamic panel regression (the system GMM) methodologies. We specifically focus on the investment-TC relationship and investigate the usage of supplier financing allocated toward funding investment. We consider various scenarios

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[4]Agency cost arises from separation of ownership and management and refers to wasteful use of resources (see Jensen, 1983).

where a shareholder owns at least 20% of a business, the largest shareholder is also the CEO, or the CEO is also a board member in a company. Despite overwhelming evidence of TC's positive contribution to performance measures presented in the literature, BIST family companies do not seem to be taking advantage of this lucrative source of funding. While we do not observe significant differences between family and non-family companies' TC policies, family companies use significantly less TC in financing their capital expenditures.

The choice of financing in family companies has been subject to numerous studies. Undiversified ownership structure, sizeable portion of family wealth invested in a small number of companies (Shleifer & Vishny, 1986) and avoidance of debt financing are among the commonly observed characteristics in these firms (Ampenberger, Schmid, Achleitner & Kaserer, 2013). An opposing view, stating that family firms borrow more than an average firm owing to the lack agency related issues, thanks to the presence of large shareholders, has also found support in the literature (see King & Santor, 2008; Setia-Atmaja, Tanewski & Skully, 2009).

Despite the fact that TC is the second-most important source of external funding and most firms heavily rely on it for short-term liquidity, most of the studies in this literature focus solely on financial leverage decisions in family firms, and TC policies in these firms have been neglected. Although the literature includes some examples such as Wang, Wu, Yin and Zhou (2019) and Chen, El Ghoul, Guedhami, Kwok, and Nash (2021) exploring how state ownership influences traditional and alternative financing decisions, family ownership and reliance on supplier financing has not been studied. The novelty of this study, however, is that it investigates TC policies in family firms, which, to our knowledge, has not been considered previously. Hence, this article is closely linked to a branch of the literature that focuses on ownership structure and financing choices, and therefore fills an important gap and contributes to the literature by examining TC policies in family companies in relation to agency theory.

2.   THORETICAL BACKGROUND

Most firms, at least to a certain degree, depend on external funding in financing their growth and, despite a large body of literature on the effects of capital structure on performance measures, empirical findings regarding the effects of financial leverage on firm performance are inconclusive at best. For example, some studies (e.g., Margaritis & Psillaki, 2010; Giroud, Mueller, Stomper & Westerkamp, 2012, p. 682) point out that leverage has a positive influence on performance, whereas others (e.g., Vithessonthi & Tongurai, 2015)

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present a negative association between them. Coricelli, Driffield, Pal ve Roland (2012, p. 1657) has found that leverage positively effects performance, yet overleveraging is detrimental to it. It triggers the risk of bankruptcy and hurts profitability, implying that beyond optimal points firms should switch to alternative sources for financing. Furthermore, high leverage renders firms vulnerable to macroeconomic shocks (Love, Preve & Sarria-Allende, 2007) and it is more challenging to raise external funding in times of monetary tightening (Kiyotaki & Moore, 1997). Nevertheless, financial debt continues to be the most preferred external source of funding.

Whereas in another branch of the literature it has been discussed that TC, an easily accessible source of funding provided by business partners, can replace bank financing and boost performance measures significantly. Studies that have considered the TC-performance relationship have reported a statistically significant positive correlation between the two (e.g., Goto et al., 2016; Farooq, Ahmed & Tabash, 2021). Some studies (e.g., Aktaş et al., 2012; Carbo-Valverde, Fernandez & Udell, 2016; Yano & Shirashi, 2020) have documented that when firms have to deal with severe financing constraints, they tend to finance physical investments via TC borrowed from suppliers. Accordingly, TC is the second-most important source of external funding and finances at about 13% of the total assets of an average firm. It is commonly used by young and small firms that lack access to traditional debt financing (Ferrando & Mullier, 2013, p. 3037), and firms that need external funding and wish to avoid the risk of bankruptcy (Molina & Preve, 2012).

The reason why suppliers are motivated to offer TC to their clients in the first place is a subject examined in a number of studies. Some of them approach the issue from the perspective of the seller and the others from that of the buyer. While it is a source of liquidity to borrowing firms, allowing them to finance inventory investment and sales, from a seller's point of view it is an instrument used to achieve long-term goals related to partnership (see, for example, Nadiri, 1969). Sellers offer liquidity to buyers to achieve long-term relationships with them (Cunat, 2007). Understandably, however, its ability to substitute financial leverage is limited because of its very nature. Firms need to liquidate borrowed inventory before they can use the associated funds in financing their operations (Karakoç, 2022, p. 157), which may increase the cost of inventory and the amount of bad debt[5], both of which may be cited as major downsides to borrowing TC. The literature includes studies that show how TC can be used as a source of funding. Although the cost of borrowing and associated inventory-related costs

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[5] Bad debt refers to trade debt that becomes uncollectible.

reduce its attractiveness as a source of funding, the fact that it is easily accessible has made it one of the primary sources of such.

While the key variables such as firm size, the amount of collateralizable assets, existing level of liquidity, taxation, the cost of bankruptcy, and agency costs are considered the main determinants of firms' capital composition (Wiwattanakantang, 1999) ownership structure is also an important variable that should be accounted for because personal preferences of managers and belief systems of families in family companies tend to be effective in financing choices (Matthews, et al., 1994, p. 350; Romano, Tanewski & Smyrnios, 2001). Unfortunately, existing capital structure theories do not take the effects of family beliefs and values on financing decisions into consideration. For example, Barton and Matthews (1989) and McMahon and Stanger (1995) argue that family companies are not influenced by market pressure and, because they do not have to respond to anyone, their personal belief systems are extremely effective in financing choices.

In a business arrangement, the seller is naturally inclined to provide TC only to buyers with prolonged histories of reliability because the more TC is offered the more likely the amount of bad debt is to increase. Therefore, trust and history of a partnership are the key determinants of credit conditions (Amoako, Akwei & Damoah, 2021). In most family companies, the largest shareholders also tend to be the founding partners (Minh Ha et al., 2022). As a result, family members have been in the business from the beginning, occupying top management positions and are likely to be known by the other industry players, which helps to establish close formal – as well as personal – ties with business partners in comparison to a manager who has only been in that position for a few years. In other words, family companies, due to their long history of being in their respective businesses, are more like to have stronger relationships with suppliers, which creates an advantage in obtaining TC with better terms.

Therefore, we suspect:

H_1: Family companies borrow more from their suppliers in comparison to non-family companies.

Early studies such as Aivazian, Ge and Qiu (2005) and Lang, Ofek and Stulz (1996) investigate the investment and debt relationship. Interestingly they find that both private and public firms prefer to rely on internal revenues in financing investment. During a period of monetary contraction, while other companies tend to increase leverage, family companies try to survive such chaotic periods by relying on their own resources, which can be considered a confirmation of their tendency to avoid leverage. Ampenberger et al. (2013, p. 249) argue that this, in fact, is the result of the absence of agency-related

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problems, which eliminates the need to carry large volumes of debt to discipline managers, i.e., limit managerial discretionary expenses. While this argument for under-leveraging in family companies is plausible, it is not the case for all of them as some studies have reported opposing patterns in the financing structure of such companies (e.g., King & Santor, 2008 and Setia-Atmaja, Tanewski & Skully, 2009).

Fisman and Love (2003) were the first to discuss the possibility of using TC to finance growth opportunities. They find that in emerging economies where financial credit supply is limited, firms with significant growth opportunities borrow from suppliers to finance their growth and this reliance further intensifies in times of economic contraction when credit supply conditions further deteriorate. Carbo-Valverde et al. (2016) also examine Spanish SME's TC borrowing behavior and they conclude that firms that have to deal with financing constraints borrow more TC to finance their physical investment. They observe that this pattern became even more distinguished during the 2008 mortgage crisis of which financial institutions were at the center. Similar findings are reported for Chinese firms by Yano and Shiraishi (2020), who studied the TC-investment relationship in publicly traded Chinese firms, finding that those that are not owned by the State actually use TC to fund investments; the strength of the correlation they found increased during the 2008 period. They point out the degree of access to institutional finance as the main cause of the difference in the TC policies of state-backed and privately-owned firms. Aktas et al. (2012) discuss this issue and propose that managers that are vigilant about companies' limited resources should choose TC to replace debt financing to the extent to which it is no longer viable. This is because borrowing TC actually means borrowing inventory and, therefore, this limits managers' discretionary expenses. They also provide the results of their empirical analysis, showing that firms that are heavily financed via TC are much more profitable than their counterparts.

In summary, the academic literature includes a number of studies that concentrate on firms' ability to create economic value and increase their performance, and how these key variables are influenced by the choice of financing such as bank loans and TC from suppliers. What stands out is that financial debt beyond a certain point becomes extremely costly and naturally unproductive and detrimental to performance, bringing firms closer to bankruptcy. On the other hand, because of TC's positive effect on performance it would be more reasonable to observe heavy use of TC in firms managed by those managers who are concerned with wealth maximization. Since family companies are not afflicted by the problems arising from separation of management and ownership, they are more likely to do what is best for the company which,

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according to the extant literature, is to finance assets via TC as much as possible. Therefore;

H_2: More trade credit is used in financing capital expenditures in family companies

An empirical study exploring TC policies in family firms will, first of all, fill an important gap in the literature by showing whether non-separation of family and ownership has any meaningful impact on borrowing from suppliers. Secondly the findings can be enlightening when reconciled with the findings of existing studies focusing on ownership structure and the use of external finance.

3.   DATA AND METHODOLOGY
3.1.   Data

In the empirical analysis, the financial data of publicly traded Turkish firms is used. The necessary financial statement items are procured from DataStream. The data cover the period 2006-2019 and the original sample includes 202 firms from non-financial sectors. The data related to board and ownership structures is provided on www.kap.org.tr. The aim of this website is to inform the public regarding news concerning firms listed in Borsa Istanbul (BIST).

In selecting appropriate explanatory variables, we rely on the existing literature (e.g., Aktas et al., 2012, Karakoç, 2021), which suggests that firms' TC policies are affected by a number of factors including firm size, the amount of fixed assets, the level of liquidity, and profitability. Love et al. (2007) argue that large firms are able to receive relatively more TC due to their competitive power, whereas Ng, Smith and Smith (1999) assert that large firms' ability to obtain significantly more trade debt can be explained by their reputation. As they have become an important player in their respective industries they tend to demand more TC, and because of their existing reputation among suppliers they are much more likely to receive TC under the terms and conditions they impose. Thus, the literature emphasizes the correlation between firm size and the amount of TC. Similar to existing studies (e.g., Karakoç, 2021), we use level of cash as a measure of short-term liquidity. While some studies report a negative association between liquidity and TC, some indicate a positive association, arguing that firms hold cash to cover short-term debt obligations such as TC (see for example Hill, Kelly, Preve & Sarria-Allende, 2017; Yano & Shiraishi, 2021).

According to Ali (2011), fixed assets constitute collateral that can be used in drawing funds from banks, implying that the more fixed assets a firm has the more leverage it can impose on thusly reducing the need for alternative sources such as TC, assuming that this actually substitutes bank financing.

Finally, leverage is another key variable that determines firms' interest in TC. Some of the studies have reported a negative relationship between the two, arguing that firms that have difficulty obtaining loans from financial institutions instead satisfy their need for external funds by receiving TC from their partners (Kestens, van Cauwenberge & Bauwhede, 2012). On the other hand, field evidence also indicates the positive association that firms with higher leverage tend to carry more TC as well. Some studies (e.g., Molina & Preve, 2012) even show that financially distressed firms with high levels of leverage are cut off from bank credit and they turn to their partners for financing, implying that firms that lack access to such sources may be inclined to compensate by using more TC. Nevertheless, it is wise to acknowledge the existence of mixed evidence of TC's relation with financial leverage. Hence, the explanatory variables listed in Table 1 are determined in light of the existing literature and include key variables discussed here.

We removed one percent from each end of the series to eliminate the effects of outliers (for a similar procedure, see Callen and Segal, 2013, p. 226) As is customary, we made sure that negative sales, negative assets, and observations in balance sheet items, after they are scaled by total assets, that are greater than one and smaller than zero are dropped. Finally, firms with less than four observations are eliminated; we are left with 1404 observations for 173 firms from various sectors.

Table 1: Descriptive Statistics

Variables	Observation count	Mean	Std. variation.	Minimum	Maximum
Trade credit	1,404	0.130	0.106	0.001	0.626
Cash	1,404	0.059	0.077	0.001	0.513
Fixed assets	1,404	0.336	0.215	0.001	0.775
Total assets in natural logarithm	1,404	13.46	1.904	8.516	18.65
Leverage	1,404	0.157	0.152	0.001	0.873
Capital expenditure (Capex)	1,374	0.055	0.055	0.001	0.342
Profitability	1,404	0.032	0.1131	-1.347	0.498

The table presents variables used in regression analysis. Originally, all values were in Turkish Lira, and for the econometric analysis, the relevant variables are scaled by total assets. For detailed descriptions of the variables, please see Table 2.

Table 1 presents the descriptive statistics of the data used in the analysis. TC borrowed from suppliers is approximately 13 percent of total assets, whereas average financial leverage is about 16 percent, which clearly shows that firms borrow from suppliers as much as they borrow from financial institutions and it is nearly as important a source of funding as bank financing to Turkish

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firms. This ratio, however, fluctuates from one percent to 63% when scaled by total assets. It is also important to note that there are very insignificant differences between descriptive statistics of family and non-family companies.

Table 2: Variable Descriptions

	Dependent variables	
TC_{it}	Trade credit (the balance of accounts payable)	$Trade\ credit_{it}/TotalAssets_{it}$
$Capex_{it}$	Capital expenditures	$Capex_{it}/TotalAssets_{it}$
	Explanatory variables	
Cash	Cash balance	$Cash_{it}/TotalAssets_{it}$
Fixed assets	Net fixed assets	$Fixedassets_{it}/TotalAssets_{it}$
Debt	Interest bearing debt	$Debt_{it}/TotalAssets_{it}$
Profitability	Profitability	$Operating\ profit_{it}/TotalAssets_{it}$
Cash flow	Cash flow	$EBITDA_{it}/TotalAssets_{it}$
Size	Logarithm of total assets	$ln(TotalAssets_{it})_{it}$
Q_{it}	Q measure	Market value of equit /Book value of equity
Cris	A dummy variable for 2008 crisis period	Cris=1 if year is 2008 or 2009, otherwise 0.
IND	Industry dummy	IND= 1 for a given industry, otherwise 0.
IND*Year	Interaction variable for year and industry	IND*Year
$family_i$	A dummy for family firms	$family_i$ =1 if largest shareholder owns more than 20%, otherwise 0

In Eq. 1, TC_{it} denotes the amount of trade debt, scaled by total assets in firm i at time t, $family_i$ is a dummy variable for family companies, X_{it-1} represents the rest of the explanatory variables. Detailed descriptions of these variables are provided in Table 2.

$family_i$ dummy takes the value of 1 for family companies and 0 for non-family firms. We define family companies as follows: those where at least 20% are owned by a person or a family, companies managed by a person who holds at least a 20% stake in the company, and finally the cases where general director/CEO is also a board member in the same company. When one examines the board structures of Turkish companies, it is not uncommon at all to observe companies that are owned by another business/legal entity which is also owned and managed by a family. Yet, it becomes extremely challenging to pinpoint these companies, because the ownership is held by another legal entity which we have no reliable knowledge. To work around this problem, we identify the firms in which the CEO is also a member of the board of directors, implying the CEO's stake in the company. Such an identification process yields 124 family companies

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out of 173 (at the end of the data cleaning process). www.kap.org.tr only provides ultimate ownership data, hence there is no way of acquiring knowledge on the ownership structure in a company 10-15 years ago. While the literature tends to rely on the idea that family firms are kept within the family from when they initially went public, i.e., very little change in ownership structure is assumed (see Minh ha et al. 2020), we adopt Ampenberger et al.'s (2013) treatment and identify owners who have a more than 20% stake in a firm and are in the financial industry. Since they are more likely to own that particular company for financial reasons alone, they are less likely to carry the characteristics of a family business. We determined 28 financial companies that meet the requirements of being classified as family businesses. After removing those, 96 firms are considered to be family firms. In 13 of these, the general director/CEO holds at least a 20% stake and, finally, in 26 of them, the general director/CEO is also a board member.

Borsa Istanbul classifies firms into 72 main and sub-industry groups and currently in 13 of those subgroups there is no firm listed. After excluding firms operating in nine finance related sub-sectors, such as insurance, consultation, investment partnership, and merging close subgroups (e.g., all subgroups of manufacturing, precious metal industry, agriculture, forestry and fishery are treated as main industries such as manufacturing, precious metals and agriculture, respectively[6]), we have firms operating 16 main industries, one of which is defined as other. Hence, regressions are estimated including 15 industry dummies and their interactions with year dummies.

3.2. Methodology

Consistent with the hypotheses presented in Section 2, we design our econometric model as follows

$$TC_{it} = \beta_i + \beta_1 family_i + \beta_2 Cris + \beta_3 IND + \beta_4 IND * Year + \beta_5 Year + \beta_n X_{it-1} + \mathcal{E}_{it} \tag{1}$$

Eq. 1 is estimated via random (firm) effect and pooled OLS regressions. The factor that motivates the choice of these methods is that $family_i$ is a time-invariant firm characteristic, and other methodologies such as FE-OLS or difference GMM automatically eliminates such variables. Thus, the current selection of econometric methods is made based on the nature of the analysis. A dummy for the 2008 crisis is also included to account for the effects of that period. All regressions are run with a constant, industry dummies, year dummies, and their interactions to filter out the effects of business cycle.

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[6] The reason for merging industry subgroups is because the original number of sector dummy variables in a regression estimation in relation to number of observations yields an excess number of parameters and consumes degrees of freedom, which in GMM estimations ultimately leads to technical problems.

Before proceeding with the analysis, we applied a Fisher-type stationarity test developed by Choi (2000) to the series because the data has gaps, for example, some of the series that belongs to firm A have observations in 2009 and 2010 but they are missing in 2011. This test accounts for such characteristics in the data. The results, given in Table A.1 in the appendix, indicate stationarity[7]. Furthermore, we estimate the Pesaran (2015) test to test for weak dependence across cross-sectional units under *H₀:* errors from estimated regressions are weakly cross-sectional dependent[8]. This test is appropriate for unbalanced panel data where N is large and T is small. As can be seen in Table A.2 in the appendix, the p value is statically significant at the 1% level, indicating no cross-sectional dependence across firms.

Firms' tendency to use TC in financing capital expenditures is explored as shown in Eq. 2.

$$Capex_{it} = \alpha_i + \alpha_1 Capex_{it-1} + \alpha_2 (family_i * TC_{it-1}) + \alpha_3 TC_{it-1} + \alpha_4 Cris + \alpha_5 Ind + \alpha_6 Ind * Year + \alpha_7 Year + \alpha_n Z_{it-1} + \mathcal{E}_{it} \qquad (2)$$

In Eq.2, $Capex_{it}$ denotes capital expenditures, $family_i$ family companies, TC_{it} the amount of trade credit, Z_{it} rest of the explanatory variables such cash flow, financial leverage and Tobin Q. We conduct estimations utilizing the system GMM analysis. As is customary in the literature, it is assumed that there exists a strong persistency in firms' investment behavior, which can be captured in the analysis via once-lagged investment variable being added to the analysis as one of the explanatory variables. However, such an addition would lead to the endogeneity problem, $E[Capex_{it-1}\mathcal{E}_{it}] \neq 0$, which leads to inconsistency in the estimated coefficient and thus makes it necessary to use proxy variables. The advantage that GMM offers to users is that it allows the use of lags and difference of lags of explanatory variables as proxies for the original variable. This way, the new variable will be highly correlated with the original variable and uncorrelated with error terms. This method is commonly used in the investment literature (see for example Yano & Shiraishi, 2020).

4. EMPIRICAL FINDINGS
4.1. Trade Credit Borrowing in Family Companies

Traditionally, family companies are founded and management is kept within the same family thereafter (Minh Ha et al., 2020); and, because of this long family history, they are more likely to be well- known by other significant players, e.g., creditors, suppliers, allowing reputation and trust to be established,

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[7] This test is conducted in Stata using "xtfisher" code

[8] This test is conducted in Stata using "xtcd2" code.

which is one of the key elements in business life that encourages sellers to offer TC along with their goods and services. Hence, hypothesis 1 proposes that such a reputation works to their advantage in enabling them to obtain more TC.

The hypotheses investigated in this study are designed to reveal the importance of TC in capital structure and in financing capital expenditures in family companies. Accordingly, the main goal of this exercise is to explore whether TC policies are different in family companies. To achieve this goal, we separated family companies via dummy variables. These dummy variables take a value of 1 for the cases specified, and 0 otherwise. Positive and statistically significant coefficients for these dummy variables would indicate that family firms borrow more TC, whereas negative coefficients would indicate the opposite. Eq.1 is estimated via random effect OLS and the results are presented in Table 3, columns 1 through 4. Robust standard errors for coefficients are in parentheses. The coefficients for the dummy variables are 0.25, 0.009, and -0.008, and they lack statistical significance, which suggests no significant differences between TC policies of family and non-family firms. The results of pooled OLS regression analyses are also presented in Table 3, columns 5-8. Overall, the magnitudes of the coefficients for family dummies are relatively weak, and they also lack statistical significance, yet the coefficient for $family_i$ is positive and significant at the 1% level.

Table 3: Trade Credit Borrowing in Family Companies

Dependent variable: Trade credit	Random effect OLS				Pooled OLS			
	1	2	3	4	5	6	7	8
Cash	-0,019	-0,019	-0,019	-0,019	-0,080	-0,080	-0,080	-0,080
	(0,03)	(0,03)	(0,03)	(0,03)	(0,06)	(0,06)	(0,06)	(0,06)
Fixed assets	-0,03***	-0,03***	-0,03***	-0,03***	-0,12***	-0,12***	-0,12***	-0,12***
	(0,02)	(0,02)	(0,02)	(0,02)	(0,02)	(0,02)	(0,02)	(0,02)
Debt	0,003*	0,003*	0,003*	0,003*	-0,015	-0,012	-0,012	-0,012
	(0,01)	(0,01)	(0,01)	(0,01)	(0,02)	(0,02)	(0,02)	(0,02)
Size	-0,02***	-0,02***	-0,02***	-0,02***	-0,05***	-0,04***	-0,04***	-0,04***
	(0,01)	(0,01)	(0,01)	(0,003)	(0,001)	(0,001)	(0,001)	(0,001)
Profitability	-0,115**	-0,114**	-0,115**	-0,115**	-0,09**	-0,09**	-0,09**	-0,09**
	(0,058)	(0,058)	(0,058)	(0,058)	(0,04)	(0,04)	(0,04)	(0,04)
$family_i$		0,25				.0,03***		
		(0,197)				(0,008)		
$family\_ceo$			0,009				0,015	
			(0,03)				(0,015)	
$family\_ceo\_manage$				-0,008				0,001
				(0,02)				(0,08)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0,09	0,09	0,09	0,09	0,08	0,08	0,08	0,08
Prob > F	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

The output from the estimation of Eq.1 using an OLS panel data estimator with robust standard errors. ***, **, * denote significance levels of 1%, 5%, and 10%, respectively. All specifications are estimated with constant, industry dummies, time dummies and their interaction. TC is received trade credit, cash is cash balance, debt represents interest-bearing debt; fixed assets are net plant property and equipment, size is the natural logarithm of total assets, $profitability$ is EBITDA $family_i$, $family_{ceo}$ and $family\_ceo\_manage$ are dummy variables for family firms. For a detailed description of the variables, see Table 2.

Purchasing goods and services on credit constitutes an important source of funding. In particular, it is preferred by firms suffering from a shortage of liquidity, or those that have limited access to traditional financing in times of economic contraction in which firms have to deal with more severe financing constraints (Hill et al., 2017). Similar to borrowing from financial institutions, there are some important factors that affect borrowing from suppliers such as firm size, access to other financing sources, sales volume, and the line of business firms are operating in. However, the relationship between business partners is also another key factor emphasized in the literature. For a firm to offer TC, trust has to have been established. If the partners are below that threshold, buyers are less likely to finance the buyer (Amoako et al., 2021). This is an important aspect of family companies because most of them have been managed by the same family members since their foundation. Thus, both the company and the people in key positions in that company are likely to be well known to suppliers. Expectedly, a prolonged history of doing business with the same people in the same company leads to a strong relationship, which is reflected in accompanying business decisions. Hence, family companies, all things considered, are likely to be favored by their suppliers due to their family-related business connections. Nevertheless, we estimated a number of regression tests and found no statistically significant difference between the TC policies of family and non-family firms.

It is, however, important to remember that when firms borrow from their suppliers, they actually borrow inventory. Naturally, maintaining inventory costs the borrowing firm until its liquidation. Furthermore, borrowing for the sole purpose of creating liquidity may result in inefficient sales decisions in order to pass the cost of liquidity to buyers (Singhal, 2005). Hence, the cost of maintaining borrowed inventory and liquidation-related issues may limit TC borrowing in family companies.

4.2. Trade Credit in Financing Capital Expenditures

In this section, we presented the role of TC in financing capital expenditures in family companies, as presented in Eq. 2, by utilizing the system GMM panel regression method. As explained earlier, three dummy variables for the cases where the largest shareholder owns at least 20%, the CEO owns at least 20%, and the CEO is one of the board members are created and interacted with TC_{it}. The results of this analysis are presented in Table 4. All regressions are conducted with a constant, industry dummies, year dummies, and their interactions. Heteroscedasticity and autocorrelation robust standard errors for estimated coefficients are given in parentheses. The coefficients for interaction variables indicate that family companies, in comparison to non-family companies, rely less on TC in financing capital structure and this finding is

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supported by the remaining TC-family interaction variables.

Our findings conclusively indicate the existence of a negative association between TC and investment in family companies, differing from the findings reported in the previous literature (e.g., Fisman & Love, 2003; Carbo-Valverde et al. 2016; Yano & Shiraishi, 2020).

Although one may argue that, because of family ownership, these firms do not need to employ interest-bearing debt to discipline managers, borrowing funds from external sources altogether seems to be a secondary choice when it comes to financing investment. TC is an easily accessible source of funding and can contribute to performance measures noticeably. Our findings, when considered from the leverage-investment perspective, however, are compatible with those in the literature.

Table 4: The Usage of Trade Debt in Financing Capital Expenditures

Dependent variable: Capex

	1	2	3	4	5	6	7
$Capex_{it-1}$	0.31***	0.31***	0.31***	0.31***	0.31***	0.30***	0.31***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Cash	0.05**	0.05**	0.05**	0.05**	0.05**	0.05**	0.05**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Debt	0.025**	0.025**	0.025**	0.019**	0.019**	0.019**	0.019**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Size	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Cash flow	0.07***	0.07***	0.07***	0.08***	0.08***	0.08***	0.08***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Q measure	0.03***	0.03***	0.03***	0.02**	0.02**	0.02**	0.02**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
TC			0.02		0.02		0.003
			(0.02)		(0.02)		(0.01)
$family_i \ x \ TC$		-0.015	-0.05**				
		(0.011)	(0.02)				
$family\_ceo \ x \ TC$				-0.05***	-0.04***		
				(0.01)	(0.01)		
$family\_ceo\_manage \ x \ TC$						-0.03**	-0.03**
						(0.01)	(0.01)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR (1)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2)	0.059	0.063	0.062	0.070	0.068	0.072	0.071
Hansen	0.413	0.275	0.388	0.192	0.195	0.200	0.206

The output from the estimation of Eq.2 using the system GMM estimator with robust standard errors. ***, **, * denote significance levels of 1%, 5%, and 10%, respectively. All specifications are estimated with constant, industry dummies, time dummies and their interaction. $Capex$ denotes capital expenditures, TC is received trade credit, cash is cash balance, debt represents interest-bearing debt; Q measure is the market cap divided by the book value, growth is growth in sales, size is the natural logarithm of total assets, $profitability$ is EBITDA $family_i, family_{ceo}$ and $family\_ceo\_manage$ are dummy variables for family firms. For a detailed description of the variables, see Table 2

5.   DISCUSSION

The main goal of this study is to examine supplier financing policies in family companies. The study was conducted using secondary quantitative data from 173 firms listed in BIST between 2006-2019 via the panel regression method. In accordance with the first hypothesis, the effect of family company status on firms' use of TC was investigated, concentrating on identifying the differences between the TC policies of family and non-family firms. Alternative dummy variables for family status, used in the empirical investigation, reveal that, contrary to our prediction specified in H_1, there are no significant differences between the policies of the two groups.

Family companies are defined as those where at least 20% is owned by a person or a family (Miller & Le Breton-Miller, 2006; Minh Ha, Do, & Ngo, 2022), thus the company policies are inevitably affected by the ownership structure. Considering that they are less likely to suffer from agency-related issues and more likely to take decisions intended to maximize shareholders' wealth, one would naturally expect to see prominent TC-related policies that increase profitability. However, our results indicate no significant difference in the TC policies of these firms. Hence, the second hypothesis, trade debt is benefitted more in financing investments in family companies, is also rejected.

Trade debt can compose an important source of funding for companies that have difficulty in obtaining external funding. It comes from suppliers, a friendly party, and is considerably less likely to trigger the risk of bankruptcy. Accordingly, the existing research shows that using credit purchases as an alternative source of funding in place of cash credits, when viable, will prevent waste of resources and thus contribute significantly to performance measures which naturally leads to the fact that managers, whose sole intention to maximize the wealth of shareholders, as in the case of family companies, should finance operations via such sources to increase efficiency.

Nevertheless, it would be intuitive to consider what is found empirically and firms' approaches to external financing together. Because some (e.g., Berger, Ofek & Yermack, 1997; Lean, Ting & Qian, 2015) argue that the risk aversion attitude in family companies leads to under-leveraging because managers that are also family members avoid risk and, hence, they mostly use internal resources. This philosophy in family companies results in low levels of leverage, keeping a lid on financial risks; however, it is difficult to argue that such policies are compatible with long-term growth plans because growth requires funding, and in most cases internal revenues do not suffice (Bertrand & Schoar, 2006, p. 90).

The main advantage associated with TC is the convenience in borrowing it from business partners who share common goals. Since the continuity of a

buyer also benefits the associated seller, the latter may be eager to offer credit in the form of TC. Nevertheless, we find that family firms employ significantly less TC than their counterparts. We can only speculate that this is either because they have strong access to alternative sources and, therefore, they tend to borrow less, or is related to managerial attitudes toward borrowing from external sources. In all, the results are consistent with certain examples from the literature while contradicting others.

Thanks to the non-separation of ownership and management in family firms, owners can keep managers in check and thus minimize agency-related costs. Unlike those in non-family companies, managers who are also family members are motivated to refrain from wasteful use of resources. Therefore, in these companies, there is no need for the disciplining effect of debt (Schmid, 2010). In other words, because owners are also the managers, i.e., they keep other executives under close control, they do not need to borrow financial debt to prevent unproductive use of internal resources. Instead, family companies should be operating on a higher level of supplier financing.

This study is not without limitations. Our key variable, ownership structure, is static and represents the ownership structure at the time of data collection. However, the data cover 2006-2019, therefore the underlying assumption is that the portion of equity in a business owned by a family has not changed significantly throughout this period. While earlier the logic behind this setup was explained it is to be acknowledged.

Appendices

Table A.1: Fisher unit root test results

H0: Variables have unit root (non-stationary)		
Variable	Chi-Sq.	Prob
Trade credit	359.05	0,000
Capex	446.41	0,000
Cash	460,60	0,000
Fixed assets	360,90	0,000
Debt	665,50	0,000
Size	518.78	0,000
Profitability	322.84	0,003
Cash flow	439.21	0,000

Table A.2: Cross sectional dependence test results

Pesaran (2015) test for weak cross-sectional dependence.
Residuals calculated using predict, residuals.
Unbalanced panel detected, test adjusted.
H0: errors are weakly cross-sectional dependent.
CD = 81.47
p-value = 0.000

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8.   AUTHOR CONTRIBUTIONS

BK UA: The idea;
UA, BK: Design;
UA, BK: Collection and / or processing of resources;
BK, UA: Empirical Analysis and / or interpretation;
UA, BK: Literature search;
BK, UA: Writer

9.   ETHICS COMMITTEE STATEMENT AND INTELLECTUAL PROPERTY COPYRIGHTS

This manuscript has been prepared and submitted in accordance with

the ethical rules. Ethics committee approval was not required for this study.

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