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FINANCING FIRM GROWTH WITH NET TRADE CREDIT: EMPIRICAL EVIDENCE FROM AN EMERGING ECONOMY

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Muhammad Younis
Department of Management Sciences, COMSATS University Islamabad, Wah Campus, Wah Cantt. Pakistan

Majid Jamal Khan
Department of Management Sciences, COMSATS University Islamabad, Wah Campus, Wah Cantt. Pakistan

Corresponding Email: younisaslam@gmail.com

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ABSTRACT

Purpose: This study examines the influence of net trade credit on firm growth. While previous research has primarily focused on the impact of trade credit payables on firm performance, this study suggests that firms may use both payables and receivables (net trade credit) as a financing tool to support their growth.

Design/Methodology: This study analyzes a sample of non-financial firms listed on the Pakistan Stock Exchange from 2009 to 2019. To address potential reverse causality between net trade credit and firm growth, the Two-Stage Least Squares (2SLS) estimation method is employed to ensure robust results.

Findings: The findings indicate that firms actively use net trade credit to finance their growth. Additionally, bank loans negatively affect firm growth, suggesting that firms may face constraints in accessing traditional financing. As a result, these firms rely on trade credit to fund their growth.

Originality/Value: This research is novel as it shifts the focus from trade credit payables alone to net trade credit, employing 2SLS estimation to strengthen causal inference. It provides valuable insights for academics, practitioners, and policymakers.

Limitations /Future Recommendations: This study is limited to listed non-financial firms in Pakistan, which may reduce the generalizability of findings to other economies. Future research could explore net trade credit's role in private firms, SMEs, or firms in different financial environments.

Keywords: Net Trade Credit; Accounts Receivables; Accounts Payables
Paper type: Research Paper

INTRODUCTION

When payments do not occur simultaneously for goods and services, the supplier provides short term loan to the client in the shape of accounts payables. On the other

hand, when firms lend to customer firms or provide goods and services on short term loan basis, it is called trade receivables. Both accounts payable and accounts receivable make up trade credit. Trade credit is a significant financing option, particularly when firms encounter challenges in securing external financing or bank credit. Despite its costliness, non-financial companies frequently utilize trade credit for short-term financing. This is because trade credit serves as an alternative to bank loans and capital market financing, as found by a number of previous studies e.g. (Danielson & Scott, 2004)., (Jain, 2001)., (Yang, 2011). This phenomenon becomes even more pronounced in the case of the undeveloped markets where the capital, debt and bank financing are not easily available ((Yang, 2011), (Atanasova & Wilson, 2003), (Nilsen, 2002), (Lin & Chou, 2015)). For example, in a sample of European firms after financial crises 2008, (McGuinness, Hogan, & Powell, 2018) found that trade credit provided safety to financially constrained firms and reduced their likelihood of financial distress.

Trade credit is closely related to firms' need to finance production and is used by firms in two ways. A firm can function as both a supplier and a customer. Its accounts receivable show the amount it lends to its customers, while its accounts payable represent the amount it borrows from suppliers. Overall, receiving trade credit from suppliers may be crucial for firms as it may finance their production, yet it may also be important for them to extend trade credit to finance sales thereby selling goods to their constrained customers. Furthermore, research indicates that companies willing to offer trade credit are often those that have received it from their own suppliers. We propose that the interaction between both components of trade credit (accounts payable and receivable) is what greatly affects a firm's growth.

The existing literature shows some evidence to this view especially in developed economies e.g. (Petersen & Rajan, 1997b) in USA, (Alkhatib & Al Bzour, 2011) Jordan, (Carbó-Valverde, Rodríguez-Fernández, & Udell, 2012), (Burkart & Ellingsen, 2004), (Danielson & Scott, 2004) and (Ferrando & Mulier, 2013) in Euro area. However, in developing countries like Pakistan, financial markets are less advanced, and there are limited financial institutions available to meet firms' short-term financing needs. In such countries where credit markets are less developed, firms rely more on credit to customer firms to mitigate the role of financial institutions. These firms further extend credit to the final customer therefore the parent firm will receive its payments when the final customer pays its amount to its supplier.

In this study, we investigate the impact of trade credit on the growth of non-financial firms in Pakistan over an 11-year period from 2009 to 2019. The corporate sector in Pakistan serves as a natural environment for examining the role of trade credit in firm growth. Firstly, many firms here face constraints due to limited access to capital markets for financing production and growth opportunities. Secondly, short-term bank financing options are scarce and expensive, making them less favorable for most firms. Given these circumstances, firms are likely to rely more on trade credit to finance their growth endeavors.

Our study contributes to the literature by focusing on the role of net trade credit (i.e., both accounts receivable and payable) as a comprehensive financing tool for firm

growth, especially in the context of emerging markets like Pakistan.Unlike previous studies that often examine trade receivables or payables in isolation, our research examines the net position, providing a more complete understanding of how inter-firm credit relationships influence growth.The study also provides new evidence on how financially constrained publicly listed firms may substitute bank loans with trade credit, which is particularly relevant given the underdeveloped financial systems in many developing countries.

We have explicitly stated that the research focuses on non-financial firms listed on the Pakistan Stock Exchange (PSX-100 Index) over a defined sample period.The study uses panel data econometrics (2SLS and GMM) to account for endogeneity and validate causal relationships.The scope is limited to firm-level financing behavior, particularly the trade-off between bank loans and trade credit, and its impact on firm growth, without delving into macroeconomic or sector-wide dynamics.

The rest of the paper is structured as follows: The subsequent section provides a brief overview of relevant literature; Section 3 outlines our Sample, Data, and Methodology; Section 4 presents our analysis and discussion; and Section 5 offers concluding remarks.

LITERATURE REVIEW

Overview of Trade Credit and Its Financial Role

Trade credit is a widespread and essential form of inter-firm financing, where firms procure goods or services and delay payments until a future date. This financial chain continues throughout the supply network until the final product reaches the consumer (Ferrando & Mulier, 2013). Even though trade credit is often considered a costly financing option, many firms prefer it due to its accessibility and flexibility. Firms may also pledge receivables to banks for short-term financing or insure them to mitigate default risk and enhance profitability. Fontaine and Zhao (2021) highlighted that trade credit is not only popular in advanced markets like the U.S., where it exceeds short-term debt financing, but is also critically important for firms experiencing bank liquidity constraints. Amberg et al. (2021) pointed out that liquidity shocks impact a firm's financial structure holistically, affecting payables, receivables, cash holdings, and bank credit simultaneously. In such scenarios, trade credit serves as a buffer for liquidity management.

Ersahin, Giannetti, and Huang (2024) highlighted the critical role of trade credit in maintaining supply chain stability during operational shocks. Their study shows that when a supplier faces disruptions such as natural disasters, it tends to extend more trade credit to downstream firms to preserve business relationships and mitigate supply chain breakdowns. This stabilizing effect is not limited to individual firms but spreads throughout the supply network, as upstream suppliers also extend credit to support distressed firms. However, the study also finds that the effectiveness of this mechanism is contingent on the financial strength of the firms involved when

suppliers themselves are financially constrained; they are less able to provide credit, leading to potential disruptions across the entire chain.

During the COVID-19 pandemic, firms adjusted their trade credit strategies to mitigate risk and ensure operational continuity. Luo (2021) finds that firms accelerated their adjustments toward target trade credit levels in response to heightened operational uncertainty. Similarly, Al-Hadi and Al-Abri (2021) documented that global fiscal policy response to COVID-19 increased firms' reliance on trade credit, particularly in environments where conventional financing was less available. Recent literature also introduces the concept of sustainability-linked trade credit. Fahim and Mahadi (2023) explore how firms offering "green trade credit" use it as a tool to promote environmentally sustainable practices among supply chain partners, thereby aligning financial and Environmental, Social, and Governance (ESG) objectives. Furthermore, Farooq et al. (2021) provided evidence from Pakistan showing that bank financing complements trade credit usage, helping firms optimize financial performance when bank loans are strategically employed alongside inter firm credit.

Trade credit also plays a strategic role. Suppliers often extend credit as a product guarantee, enabling buyers to inspect goods before paying (Long, Malitz, & Ravid, 1993). Emery (1987) argues that firms have better monitoring capabilities over customers compared to banks, which gives them an advantage in offering trade credit. However, Petersen and Rajan (1997a) note that firms may bear high implicit costs for this financing paying above market rates due to lack of access to traditional credit sources. Chod, Lyandres, and Yang (2019) emphasize that within supply networks, suppliers may bear a significant share of customer purchases by offering large volumes of trade credit. McGuinness et al. (2018) further assert that net trade credit comprising both receivables and payables better reflects the full spectrum of a firm's financing relationships and can significantly reduce financial distress, particularly during periods of economic uncertainty.

Trade Credit in Developed vs. Developing Economies

The nature and use of trade credit vary considerably between developed and developing economies. In advanced economies, trade credit serves both as a financing mechanism and a competitive tool. Gofman and Wu (2022) find that in the U.S., downstream firms in supply chains tend to issue and receive more trade credit, which correlates positively with profitability. Trade credit also allows firms to maintain relationships with retailers and optimize inventory management (Chod et al., 2019).

In contrast, developing countries often rely on trade credit due to weak legal systems, underdeveloped financial markets, and limited access to bank financing. Maksimovic (2001) shows that in countries with weak legal institutions, trade credit is a more common financing tool. Manova, Wei, and Zhang (2015) demonstrate that domestic firms in such countries, when financially constrained, tend to export less unless they are affiliated with foreign capital sources. Bougheas, Mateut, and Mizen (2009) explain that increases in production costs require additional liquidity, making trade credit vital for operational financing. Fisman and Love (2003) observe that in

countries with less advanced financial intermediaries, firms with higher accounts payable grow more rapidly. Meltzer (1960) provides an early explanation of trade credit's role as a redistribution tool during tight money conditions where financially stable firms extend credit to less stable ones.

Recent evidence also suggests that institutional and technological developments influence trade credit differently across economies. Afrifa and Gyapong (2017) find that in developing contexts, trade credit determinants include firm size, operating cash flow, and export orientation. Similarly, Farooq et al. (2021) observed that firms in Pakistan use trade credit more actively when supported by complementary bank financing. These findings stress the institutional dependencies of trade credit access in different financial systems.

Trade Credit, Financial Constraints, and Firm Growth

Financial constraints are a major determinant of trade credit usage and firm growth. When access to bank financing is restricted, firms turn to trade credit as a necessary substitute. Cole (2018) emphasizes that insufficient credit slows down firm growth, employment, and economic output. Frank and Maksimovic (1998) suggest that trade credit is more likely when suppliers can easily resell the goods in case of customer default. During periods of uncertainty, firms reduce investment and employment. Choi et al. (2018) find that under such conditions, firms adopt a "wait and see" strategy, decreasing capital allocations to technology and innovation. This highlights the need for flexible financing such as trade credit. According to McGuinness et al. (2018), SMEs in particular shift toward inter-firm credit, especially when facing limited bank access or when lender scrutiny is high.

Afrifa and Gyapong (2017) conducted a study on the determinants of net trade credit. The balance between trade receivables and payables. Their results reveal that firms with higher inventory levels, larger market share, or facing financial distress tend to hold less net trade credit. Conversely, firms that exhibit strong operating cash flows, robust sales growth, export orientation, better access to bank credit, and larger firm size are more likely to invest in net trade credit. During periods of industry competitiveness and financial crisis, firms strategically adjust their trade credit usage, reducing it when constrained, and increasing it when financially resilient. Fahim and Mahadi (2023) extend the discussion by emphasizing how sustainable practices can be supported via trade credit. They argue that ESG driven credit allocation not only reflects financial intent but may enhance long-term resilience and stakeholder trust. Trade credit is not just a financing substitute but also influences firm value. Michalski (2007) underscores that optimal management of receivables and payables is crucial for maximizing firm value. Nilsen (1999) classifies trade credit as a "financing of last resort," especially for financially constrained firms. Aktas et al. (2012) show that trade credit improves firm value even under poor governance or high-risk exposure.

Carbó-Valverde et al. (2012) find that constrained firms increase their reliance on trade credit during financial crises, while unconstrained firms prefer traditional bank loans. This is further evidenced by Chod et al. (2019), who observe that suppliers are

more likely to extend credit to retailers that form a significant portion of their business, reinforcing firm interdependence.

Bergbrant, Hunter, and Kelly (2018) argue that competition can worsen credit access by reducing firm transparency and collateral value, which increases information asymmetry and reduces innovation and growth. In such scenarios, trade credit can act as a counterbalance, enabling firms to sustain operations despite external financing limitations.

LITERATURE GAP

The review of relevant literature, as summarized above, indicates that although there has been some research on the influence of trade payables and receivables on firm performance, there is a lack of literature that directly analyzes firms' use of trade payables and receivables for financing growth. One can find the research of Fisman and Love (2003) and Molina and Preve (2012) quite related to the issue at hand but even these works are in the context of developed economies. By contrast, we analyze this relationship in a developing country i.e. Pakistan where financial markets are not developed due to which firms have limited options to finance their growth. Secondly, we posit that it is not only accounts payables that affect firm performance and growth, but accounts receivables are also an important and indirect source of growth financing. In essence the sum of both payables and receivables (i.e. net trade credit) influences the firm's growth simultaneously.

Scholars hold differing views on the impact of net trade credit on firm growth. Some researchers suggest that financial constraints may hinder a firm's ability to access credit, (Meltzer, 1960), (Petersen & Rajan, 1997a) and (Molina & Preve, 2012). This could make trade credit a more appealing choice for funding expansion. Others suggest that financial constraints can limit a firm's ability to take advantage of growth opportunities, (Baxter, 1967), (Altman, 1984) and (Andrade & Kaplan, 1998) regardless of the type of financing used.

We tried to fill this important gap in existing literature by considering net trade credit (sum of accounts payables and receivables) as a financing channel for firm growth in the situation of a developing country where firms have limitations in financing growth.

THEORETICAL FRAMEWORK

Several capital structure theories offer insights into how firms make financing decisions, including the Trade-Off Theory, Market Timing Theory, Signaling Theory, and the Pecking Order Theory. Each of these provides a different perspective on firms' choices between various financing instruments, including debt, equity, and other sources such as trade credit.

The Trade-Off Theory argues that firms aim to achieve an optimal capital structure by balancing the tax benefits of debt against the costs of financial distress or bankruptcy. It focuses on long-term financing decisions and the debt-to-equity ratio as firms seek a stable target capital structure over time.

The Market Timing Theory suggests that firms issue new equity when their stock is perceived to be overvalued and repurchase it when undervalued. This theory assumes that firms time the market based on fluctuations in equity valuations to minimize their cost of capital.

The Signaling Theory explains that firms use certain financial decisions such as extending or using trade credit as signals to convey private information about their financial health or quality to external stakeholders, especially in environments with high information asymmetry.

While each of these theories contributes meaningfully to the broader understanding of corporate finance, we did not adopt them as the central framework for this study for the following reasons:

The Trade-Off Theory was not used because it primarily applies to decisions involving the debt-to-equity ratio and long-term capital structure. In contrast, our study focuses on short-term, operational financing through net trade credit (accounts payables and receivables), which does not directly involve long-term debt or equity issuance. The Market Timing Theory was excluded because our research does not involve analyzing equity issuance behavior or timing strategies related to stock valuations. Furthermore, given the limited depth and development of equity markets in emerging economies like Pakistan, this theory has limited applicability in our context. The Signaling Theory, although relevant in trade credit literature, is more appropriate in settings characterized by high levels of information asymmetry. Our study focuses on PSX-100 firms, which are subject to strong regulatory oversight and periodic public disclosures. These conditions reduce the degree of information asymmetry, making signaling effects less significant and limiting the theory's relevance for our analysis.

Given these limitations, our study adopts the Pecking Order Theory (POT) as the most appropriate theoretical framework. POT suggests that firms follow a financing hierarchy, preferring internal funds first, then debt, and equity as a last resort (Myers & Majluf, 1984). This theory aligns closely with the behavior of firms in emerging markets like Pakistan, where access to external finance particularly formal bank loans or capital markets is often limited or costly. Under such constraints, firms may turn to trade credit as a practical and accessible financing alternative, especially when internal funds are insufficient. Since POT directly addresses financing behavior under conditions of financial constraint, it offers the most suitable lens through which to examine how publicly listed, financially constrained firms utilize trade credit to support growth.

Meltzer (1960) was the first to note that large firms use trade credit more frequently as an alternative to direct sales to boost their sales during periods of tight monetary policy. Guariglia and Mateut (2006) provided consistency with these arguments, they investigated that in UK trade credit increase under tight monetary policy and when banks restrict to provide short term loan to the firm. Schwartz (1974) argued that firm with surplus finance offers further trade credit to those customer firms who have inadequate access to long term debt finance. Frank and Maksimovic (1998) explained that firms extend trade credit to those customers who are financially constrained

because they want to build long term relations with those customers. Jain (2001) argued that firms have an advantage over banks in extending trade credit to their customers because they can gather additional information about their customers that banks may not have access to. Cunat (2007) explained that firm take advantage over bank to pay its debt when buyer can't find alternative supplier who offers trade credit. Suppliers threaten their customers that they can stop providing supply that has a negative effect on firm's production. Bougheas, Mateut, and Mizen (2009) explained that an increase in production requires more finance because increase in production will also increase production cost, it is difficult for firms to manage increase in production with given amount of liquidity. Hence an increase in production requires extra trade credit to finance firms' operations. Ferrando and Mulier (2013) found that Firms can also pledge receivables to bank to finance short term liabilities and get their receivables insured which can reduce the credit default risk and increase the profitability. McGuinness et al. (2018) asserted that trade credit is a significant tool of financing for SMEs, but total trade credit (payables and receivables) provides full role of firms' contribution in the economy. According to Chod, Lyandres, and Yang (2019), in the existence of competition, the advantage of trade credit is not completely examined because retailers not only buy products from the firms that offer trade credit but also use liquidity to buy products from other suppliers.

DATA AND METHODOLOGY

DATA AND SAMPLE

At the start, we began with all the companies listed on Pakistan's KSE-100 index over a period of eleven years from 2009 to 2019. This study used the panel data and constructed the sample based on the following criteria:

We debarred financial firms from our sample because their risk profile, industry nature and regulatory requirements are different from those of the non-financial firms. We kept those companies for which we had access to annual reports consistently spanning from 2009 to 2019. This was crucial because the lack of databases for Pakistani firms limited our ability to gather accounting data solely from annual reports. We further excluded firms that did not report data on important variables of our study, in particular on trade payables and trade receivables.

After applying the criteria mentioned above, we removed outliers and ended up with a manageable sample of 66 non-financial firms over the eleven-year period, totaling 694 firm-year observations. The data was collected from two sources: the annual reports of the firms during the sample period and from the website of the Central bank of Pakistan (the State Bank of Pakistan).

The sector-wise summary of the sample incorporated in our study is presented in Table 3.1. Table 3.1 shows the diverse range of sample. We do not limit our study to specific sector of Pakistan. We included different industries of Pakistan in our study sample. The reason for selecting a different sector is to achieve unbiased and consistent results because financial performance and growth opportunities vary from

industry to industry. While selecting diverse range of sample allow us to generalize our results in whole industries of Pakistan listed with KSE-100 index.

Table 3.1 shows that the sample of study was taken from different sectors of non-financial firms from KSE-100 index. 8% sample was taken from the automobile and parts industry, 11% from cement industry. The major portion of sample was taken from chemical products, and the pharmaceutical industry was 21%. Table 3.1 further shows 9% sample from Coke and refined petroleum industry. Manufacturing industry also contributed 9% in sample. 14% sample was from oil and gas sector while 12% from textile sector. 16% of total sample was from different other sectors of Pakistan.

Table 3.1: Sector wise percentage of sample

Sector	**Frequency**	**Percentage**
Automobile and Parts	5	8%
Cement	7	11%
Chemical Products and Pharma	14	21%
Coke and Refined Petroleum	6	9%
Manufacturing	6	9%
Oil and Gas	9	14%
Textile	8	12%
Others	11	16%
Total	**66**	**100%**

The following diagram labelled 3.1 also shows the percentage of different industries in sample.According to diagram 3.1 (8%) sample was taken from automobile and parts industry, (11%) from the cement industry. The major portion of sample was taken from chemical products and pharma industry was (21%), (9%) of total sample was from Coke and refined petroleum industry. The manufacturing industry also contributed (9%) in sample. (14%) sample was from oil and gas sector while (12%) from textile sector and (16%) of total sample was from different other sectors of Pakistani nonfinancial firms.

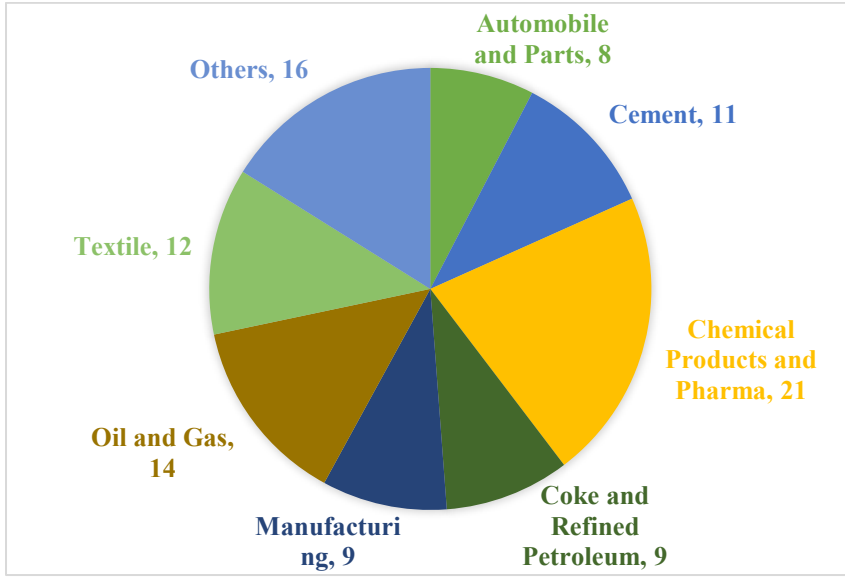

Figure 3.1: Sector wise Percentage of the Sample

MODEL

We estimate whether net trade credit has any impact on firms' growth in our sample firms. To do so we regressed the sample firms growth, added values over our measure of their net trade credit along with other control variables suggested by relevant literature.

Specifically, we test the following regression model:

$$Growth_{it}=\beta_0+\beta_1 NetTC_{it-1}+\beta_2 BLoan_{it-1}+\beta_3 Size_{it-1}+\beta_4 Age_{it}+\beta_5 SGrowth_{it}+\epsilon_{it} \quad \text{_____(1)}$$

Where,

Growth	Is real growth added value, calculated as sum of profit or loss for a given time and smaller interest, tax, labor price, depreciation and interest paid.
NetTC	NetTC is net trade credit estimated as a sum of accounts payables and receivables divided by total sale.
BLoan	Is bank loan provided to firm, Bank loan defined as short term and long-term bank loans divided by total sale.
Size	Size of the firm measured with the help of log of total assets

Age	Estimated with the log of age.
SGrowth	SGrowth is sales growth, calculated as growth value and its previous value divided by previous value.

The ordinary least square (OLS) method gives biased results if any of the explanatory variables is linked with error term. In our study there is a probability that the dependent variable growth added value (Growth), may have an impact on one of the independent variables, net trade credit (NetTC). This might signal the presence of reverse causality/endogeneity in our proposed model. In such a case, the explanatory variable (NetTC) might be associated with the error term and hence the ordinary least square (OLS) method may give biased and inconsistent results.

To remove this problem, we used instrumental variables (IV) regression by using the determinants of NetTC as instruments.

Determinants of NetTC have been used as instruments to run instrumental variable regression. These variables are Assets Turnover Ratio (ATOR), calculated with the help of sales to total asset minus receivables; Gross Profit Margin (GPM) calculated as gross profit margin to sale, Purchases (PUR) defined as purchases of raw material to total assets, Internal financing (CFLOW) is calculated by adding net profit and depreciation, then dividing by sales. The cost of financing (FCost) is defined as financing cost divided by total liabilities minus payables (García-Teruel & Martinez-Solano, 2010) (Petersen & Rajan, 1997b) and (Li, 2011) see equation (3).

While selecting instruments we ensured that instruments explain well to NerTC and are not correlated with error term of equation. Instruments made changes in explanatory variables i.e., NetTC, but no independent effect on dependent variable of the model i.e. Growth.

Using asset turnover ratio and gross profit margin as instrumental variables. These instruments fulfill the relevance condition, as they are theoretically and empirically associated with trade credit usage. Firms with higher asset turnover are typically more operationally efficient and may use more trade credit to support their working capital cycles (Love & Zicchino, 2006; Ferrando & Mulier, 2013). Similarly, gross profit margin reflects a firm's profitability and its ability to self-finance operations, which influences its reliance on supplier credit (Petersen & Rajan, 1997).

Regarding the exclusion restriction, we argue that these variables affect firm growth primarily indirectly through trade credit, and not through any direct channels, after controlling for standard growth determinants. Asset turnover captures operational efficiency, which is already reflected in trade credit behavior, while gross profit margin influences trade credit capacity but is unlikely to impact growth directly once trade credit is accounted for (McGuinness et al., 2018).

$$Growth_{it}=\beta_0+\beta_1 NetTC_{it-1}+\beta_2 BLoan_{it-1}+\beta_3 Size_{it-1}+\beta_4 Age_{it}+\beta_5 SGrowth_{it}+\epsilon_{it} \quad (2)$$

$$NetTC_{it} = \alpha_0 + \alpha_1 BLoan_{it-1} + \alpha_2 Size_{it-1} + \alpha_3 Age_{it-1} + \alpha_4 SGrowth_{it} + \alpha_5 ATOR_{it-1} + \alpha_6 GPM_{it-1} + \alpha_7 PUR_{it-1} + \alpha_8 IF_{it-1} + \alpha_9 FCost_{it-1} + \gamma_{it} \quad (3)$$

Where;

$Growth_{it}$ Is the real Growth added value of firm "i" in year "t", calculated as the adding of profit or loss for a given time and smaller interest, tax, labor price, interest paid and depreciation.

$NetTC_{it-1}$ Is net trade credit of firm "i" in year "t-1", estimated as the adding of accounts payables and receivables scaled by total sale.

$BLoan_{it-1}$ Is bank loan provided to firm "i" in year "t-1", explained as short term and long-term bank loans scaled by total sale.

$Size_{it-1}$ Size of the firm "i" in year "t-1" calculated as the log of total assets.

Age_{it} Age of firm "i" in year "t" examined as the log of the age of the firm in No of years since the year of incorporation.

$SGrowth_{it}$ Is sales Growth of firm "i" in year "t", calculated as the difference of the value of sales in year t less that in the antecedent year divided by sales in previous year.

$ATOR_{it-1}$ Is Assets Turnover Ratio of the firm "i" in year "t-1" examined as total sales to total asset minus receivables.

GPM_{it-1} Is Gross Profit Margin of the firm "i" in year "t-1" calculated as gross profit to sales.

PUR_{it-1} Is Purchases of the firm "i" in year "t-1" defined as purchases of raw material to total assets.

IF_{it-1} Is Internal Financing of the firm "i" in year "t-1" measured as net profit plus depreciation divided by total sales.

$FCost_{it-1}$ Is Cost of Financing of the firm "i" in year "t-1" defined as interest paid divided by total liabilities minus payables.

To run the above two equations, Two Stage Least Square method has been used; the two Stage Least Square Method gives unbiased and consistent results. In Two Stage Least Square Method, equation (3) runs in first stage; in equation (3) other factors of NetTC are incorporated; to get the predicted value of NetTC. In second stage, equation (2) was run and the predicted value of NetTC were used; predicted in first stage to remove the problem of simultaneity.

ANALYSES AND DISCUSSION

The descriptive statistics results are displayed in Table 4.1. They reveal that the average value of trade credit is 29%, whereas the average value of bank loans is 26%. This indicates that sample firms utilize both net trade credit and bank loans as financing tools for their operations. However, the use of net trade credit is more widespread compared to bank loans.

This study focuses on firms sampled from Pakistan. Pakistan being an emerging market provides a great opportunity to test our model. This is because most firms in Pakistan face financial constraints due to underdeveloped financial markets, offering limited options for financing operations. Typically, firms in Pakistan rely on trade

credit and bank loans to finance growth rather than using long-term debt as a financing channel (Saeed & Sameer, 2015).

Table 4.1 also reveals that the sample includes firms ranging from small, with total assets of approximately Rs. 801 million, to large, with a maximum total asset value of around Rs. 766,597 million. This reflects the fact that our sample is a well-balanced and diverse one as regards the size of the firms chosen.

Tabl34.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Growth	634	0.136	0.390	-1.688	1.983
NetTC	696	0.290	0.340	0.002	2.380
Bloan	696	0.269	0.374	0.000	3.636
Size (Rs. Million)	696	68118.22	102495.69	801.00	766597
Age (in year)	696	41.700	26.495	1.000	159.00
SG	634	0.160	0.430	-0.510	5.610

To assess the relationships in equation (1), we conducted fixed effects and random effects panel regressions on our data. To determine which model to use, we initially performed the Durbin Watson Hausman test. We employed the straightforward approach: if the p-value of the Hausman test is less than 0.05, we reject the null hypothesis, indicating that the random effects model is suitable. The results of the Hausman test are presented in Table 4.2. According to the results in Table 4.2, the p-value of the Hausman test is below 0.05. Therefore, we opt to retain the results of the fixed effects model in our study.

Table 4.2: Hausman Test Results

	Coef.
Chi-square test value	11.92
P-value	0.035

To test the relationships in equation (1) this study applied fixed effects panel regressions to data. The results are reported in Table 4.3 where Model 1 includes only industry fixed effects, Model 2 includes both time and industry fixed effects results and Model 3 includes firm fixed effects.

The results in Table 4.3 show that all the three models show a positive association among net trade credit and the growth added value of the firm. The effect of NetTC on Growth is significant at 5% in both the models (i.e. industry fixed effects and

industry and time fixed effects). The result of table 4.3 shows if the 1 unit rise in net trade credit will lead to rises growth added value by 0.22 units and 0.24 units in both models. This suggests that the sample firms might be using trade credit as a channel to finance their Growth opportunities. This finding is similar with (Ferrando & Mulier, 2013) and (Fisman & Love, 2007).

Moreover, the sample firms belong to an underdeveloped country i.e. Pakistan where financial markets are less developed and the suppliers usually play a major role by providing trade credit to customer firms. It can therefore be better expected that these firms have used trade credit as an alternate channel to fulfill their financial needs. This finding is consistent with the pecking order theory of financing by supporting the view that firms are relying more on internal sources of financing than on external sources like debt and equity.

Table 4.3 further suggests that bank loan has a negative relationship with Growth added value in both the models. This finding is similar with (Cole, 2018). According to the results one unit increase in bank loan will decrease the growth added value by almost 0.13 units. This negative relationship between bank loan and Growth added value shows that the sample firms might find it costlier to finance Growth through this source and therefore they do not rely on bank loan to finance Growth opportunities. This is because Pakistan has historically faced volatile macroeconomic conditions, often resulting in high policy interest rates. This is especially evident during periods of inflationary pressure and current account deficits. As a result, commercial lending rates are elevated, making bank loans an expensive source of capital for firms. High interest rates increase the cost of borrowing, discouraging firms especially those with constrained cash flows from relying on this source to finance growth (Rehman et al., 2019). Furthermore, Pakistani banks typically demand significant collateral usually in the form of land, buildings, or other fixed assets to mitigate credit risk. This poses a challenge, particularly for firms with fewer tangible assets. As a result, many firms are unable or unwilling to meet these requirements, limiting their access to affordable credit. The loan approval process in Pakistan can be bureaucratic and time-consuming, involving extensive documentation and regulatory scrutiny. For firms looking to seize timely growth opportunities, these procedural delays can be detrimental. Consequently, many prefer quicker and more flexible financing sources, such as trade credit (Haque & Mirakhor, 1986; Hussain & Mubin, 2012).

This again confirms the existence of a pecking order in our sample firm's financing pattern.

Table 4.3 also shows a positive association between Sales Growth and Growth Added Value. The relationship is significant at 1% in both the models. The finding further suggests that in the presence of Growth opportunities, these firms might have relied more on trade credit as compared to Bank loans and other financing sources. The results in table 4.3 also show that sales growth also plays a major role in our sample firms' growth. The rise in sales growth means the firm is performing well and depicts the positive image of the firm. Sales growth information has been used by many stakeholders such as owners, suppliers and creditors. An increase in sales growth can

help the firm to improve its resources and increase firm value (Putri & Rahyuda, 2020).

Table 4.3: Fixed Effects Regressions of Growth on Net Trade Credit.

Independent Variables	**Model 1**	**Model 2**	**Model 3**
NetTC	0.226**	0.245**	0.226**
	(0.103)	(0.105)	(0.103)
BLoan	-0.139**	-0.128*	-0.139**
	(0.0689)	(0.0706)	(0.0689)
Size	0.270	7.377	0.270
	(5.381)	(7.078)	(5.381)
Age	-23.37	-6.051	-23.37
	(17.83)	(21.64)	(17.83)
Sgrowth	0.168***	0.176***	0.168***
	(0.0335)	(0.0338)	(0.0335)
Constant	87.76	-96.20	102.1
	(68.19)	(135.7)	(67.64)
Fixed Effects	Industry FE	Industry & Time FE	Firm FE
Time fixed Effects	No	Yes	No
Industry Fixed Effects	Yes	Yes	No
Firm Fixed Effects	No	No	Yes
Observations	627	627	627
R-squared	0.145	0.179	0.157
Number of firms	66	66	66
Hausman Test (Chi Sq)	-9.60***	-24.40***	-11.93***

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

ROBUSTNESS CHECK

The ordinary least square (OLS) method gives biased results if any of the independent variables are correlated with error term. In our study there is a probability that the growth added value (Growth) may have impact on trade credit channel and it will create a problem of endogeneity/ simultaneity. In order to remove this problem, we used instrumental variables regression. Determinants of NetTC suggested by relevant literature have been used as instruments to run instrumental variable regression. These variables are Assets Turnover Ratio (ATOR), calculated with the help of sales

to total asset minus receivables; Gross Profit Margin (GPM) calculated as gross profit margin to sale, Purchases (PUR) defined as purchases of raw material to total assets, Internal Financing (IF) calculated by net profit plus depreciation divided by sale and Cost of Financing (FCost) estimated as financing cost divided by total liabilities minus payables (García-Teruel & Martinez-Solano, 2010) (Petersen & Rajan, 1997b) and (Li, 2011), see equation (3).

While selecting Instruments we ensured that instruments explain well to NetTC and not correlated with error term of equation. Instruments made changes in explanatory variables i.e., NetTC but no independent effect on dependent variable of the model i.e. Growth.

Table 4.4 shows the results of two stage least square estimations of our system of IVs equations. The findings of table 4.4 are consistent with our econometric robustness check and still show a positive association among Growth added value (Growth) and Net trade credit (NetTC). The effect of NetTC on growth is financially significant; a one-unit increase in NetTC leads to a 1.42-unit increase in growth. Like our earlier finding, table 4.4 again shows a negative affiliation among BLoan and Growth. This negative affiliation shows that firms in our study sample may find it difficult to finance growth through this source and may therefore have used trade credit as an alternate financing source. During contractionary monetary policy banks restricted firms loans; firms used trade credit channels as alternate sources to finance growth opportunities (Nilsen, 2002).

Table 4.4 further shows a positive association among Growth added value and Sales Growth (SGrowth), it shows real Growth added value increases as the firm sales increase. This relationship is highly significant, and these results are similar with (Binks & Ennew, 1996).

The positive relationship between Growth and NetTC in both methods (i.e panel regression and instrumental variable panel regression) shows the significance of our study. These results are consistent with (Ferrando & Mulier, 2013) and (Fisman & Love, 2007).

Table 4.4: Panel Instrumental Variable Regression of Growth on Net Trade Credit

VARIABLES	**Growth**
NetTC	1.428**
	(0.666)
BLoan	-0.287**
	(0.111)
Size	-1.930
	(6.127)
Age	-16.70
	(20.24)
SGrowth	0.207***

		(0.0428)
Constant		71.10
		(76.69)
Time Fixed Effects		Yes
Observations		627
No. of firms		66
Instruments of NetTC	BLoan, Size, Age, SGrowth, ATOR, GPM, PUR, IF, FCost	

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

We employed another econometric model, called the Generalized Method of Moments (GMM), to ensure the reliability of our findings. The purpose of using GMM was to verify if our results align with those obtained through instrumental variable regression. It's essential to highlight that GMM is a statistical technique that helps estimate parameters in models by matching certain statistical properties, known as moments, between observed data and model predictions. This method provides flexibility, making it suitable for situations where traditional assumptions about data distribution might not hold.

Applying GMM in our analysis allows us to assess whether the results are consistent with those obtained from instrumental variable regression. This approach enhances the robustness of our findings and strengthens the validity of our econometric analysis. The outcomes of the GMM model are presented in table 4.5 below. The results from the GMM model reaffirm the positive relationship observed between net trade credit and the growth added value of the firm, aligning with the patterns identified in our initial econometric model. Consistency across different estimation methods adds credibility to our findings, providing a more comprehensive validation of the positive association between net trade credit and firm growth. This finding is consistent with (Ferrando & Mulier, 2013)

Furthermore, our GMM analysis reiterates a negative association between Bank Loans (BLoan) and growth. This negative relation suggests that firms within our study sample may encounter challenges in financing their growth through traditional bank loans. But this finding is insignificant.

Table 4.5: GMM Regression of Growth added over Net trade credit

VARIABLES	GAV
GAV_lag1	-0.0811**
	(0.0381)
NTC	0.131**
	(0.0574)
BL	-0.121
	(0.0748)

Size	-9.809***
	(1.821)
Age	0.183
	(2.502)
SG	0.144***
	(0.0301)
ATOR	4.235***
	(1.622)
GPM	-27.48*
	(15.56)
LTD	67.65***
	(20.75)
PUR	-7.168***
	(2.763)
IF	107.9***
	(20.17)
FCOST	-0.147
	(3.915)
Constant	166.8***
	(30.73)
Observations	545
Number of firms	66

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Moreover, Table 4.5 reveals a negative correlation between the growth added value (GAV) and the size of the firm. This finding suggests that larger firms, endowed with greater negotiating power and a stronger market presence, are inclined to leverage alternative and more cost-effective sources of financing to facilitate their growth, steering away from the comparatively expensive option of trade credit (Fabbri & Klapper, 2016).

Table 4.5 also indicates a positive correlation between Sales Growth and Growth Added Value. This relationship is statistically significant at the 1% level. This observation suggests that, when confronted with growth opportunities, these firms tend to rely more on trade credit rather than bank loans or other financing sources.

Additionally, the results in Table 4.5 underscore the substantial role that sales growth plays in the overall growth of the firms in our sample. The positive association between sales growth and firm performance indicates a prospering business and contributes to fostering a positive image for the firm. Information about sales growth is crucial for various stakeholders, including owners, suppliers, and creditors. The surge in sales growth not only facilitates the enhancement of the firm's resources but also contributes to an increase in the overall value of the firm (Putri & Rahyuda, 2020).

Table 4.5 further shows a positive relationship between assets turnover ratio (ATOR) and growth added value. This finding shows that firms that manage their assets efficiently grow more compared to firms who have a low turnover ratio. This finding is consistent with (Long, Malitz, & Ravid, 1993).

CONCLUSION

This study analyzed the impact of net trade credit on the growth of the firm. According to the results of this study not only accounts receivable or accounts payables individually affect the firm's growth, but both are important for growth simultaneously. This study suggests companies' financial strategies, as indicated by earlier research and theories on capital structure vary depending on growth opportunities. This study used the instrumental variable regression model and system of two stage least Square. The panel data have been used from non-financial Pakistani firms listed in the KSE-100 index over an 11-year period from 2009 to 2019. Selecting the Pakistani market offers us a natural setting to examine the connection between the net trade credit channel and value-added growth. This is because companies in emerging markets often face underdeveloped credit markets, restricted access to external funding, and consequently, rely more on trade credit. A positive association between net trade credit and a firm's added value growth. In simple terms, companies use the trade credit channel to finance their growth. Conversely, we also noticed a negative relationship between bank loans and added value growth. This inverse relationship between bank loan and growth added value shows that the sample firms might find it costlier to finance growth through this source and therefore they do not rely on bank loan to finance growth opportunities. Findings of this study suggest that firms in under developing countries prefer trade channels to finance growth opportunities as compared to bank loans.

IMPLICATIONS

Several studies have explored the relationship between trade credit and firm performance, but the utilization of net trade credit (the sum of accounts payables and receivables) as a means to finance growth has not been clearly defined in previous literature. This study aims to address this gap by investigating how firms utilize net trade credit as a channel to finance their growth.

By having access to our research findings on the financial constraints of firms, creditors can better assess the credit risk associated with each firm. This knowledge can aid them in making more informed credit decisions, allowing them to identify financially constrained firms that are still creditworthy and have the potential for growth. Credit terms refer to the conditions under which credit is extended, such as the repayment period, interest rate, and collateral requirements. For financially constrained firms, favorable credit terms can be critical to their ability to access funds and manage their cash flow effectively.

Creditors can leverage our research to tailor credit terms specifically for financially constrained firms. Offering flexible repayment schedules or lower interest rates can facilitate access to credit for these firms, enabling them to invest in projects, expand operations, and improve overall financial performance.

Financial constraints can increase the risk of default for firms, which, in turn, raises concerns for creditors. A default on credit can lead to financial losses for creditors and impact their own financial stability.

By understanding the financial constraints faced by firms, creditors can develop risk management strategies to mitigate default risk. This may involve implementing risk pricing models or requiring additional collateral from financially constrained firms, thereby safeguarding their interests while still supporting the growth potential of these firms. Policymakers should consider the creation of a centralized Trade Credit Registry, which would help reduce information asymmetries between buyers and suppliers. A transparent credit reporting system can improve trust and facilitate access to supplier financing. Second, the legal enforceability of trade credit agreements must be enhanced through standardized contracts and dispute resolution frameworks to protect the rights of both creditors and debtors.

In addition, trade credit insurance schemes should be promoted to mitigate default risks, while digital invoicing platforms can help formalize credit transactions and create auditable trails. Tax incentives may further encourage firms to report trade credit formally, and alternative credit scoring systems should be introduced for SMEs lacking traditional credit histories.

Finally, the government should take a lead by ensuring prompt payment to vendors in public procurement processes, thereby setting an example for private sector practices. These interventions, if implemented effectively, could help unlock the full potential of trade credit as a driver of firm growth and resilience in Pakistan's developing economy.

FUTURE SUGGESTIONS

The study suggests several potential avenues for future research. Firstly, since some firms lack access to capital markets and rely solely on trade credit for financing, it's essential for future studies to identify these firms and examine their associations. Secondly, future research should consider the firm's life cycle, as financial strategies often change at different stages. Lastly, inclusion of macroeconomic indicators as an important extension for future studies, which could provide a more holistic understanding of how broader economic conditions affect trade credit dynamics and financing decisions.

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