An Empirical Investigation on Motives of Trade Credit Usage of Pakistani Manufacturing Sector

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This study aims to examine the motivation factors of firms to extend trade credit to their clients. Data are collected of 150 manufacturing firms listed at Pakistan Stock Exchange for the period 2005 to 2016. Using dynamic panel estimation, the study finds that firms are offering trade credit considering the commercial motives and helping hand motive, whereas large firms are found to be reluctant to extend trade credit. The role of concentrated markets does not prove in granting trade credit. This study also examines the impact of previous period trade credit and found to have a positive relationship, which suggests that previous credit relationships do matter for short term financing. The results of the study are useful to academic researchers and managers in specific areas of trade credit management and working capital management in general.

Keywords: Trade Credit, Dynamic Panel Estimation, Working Capital Management, Manufacturing Sector

INTRODUCTION

Short-term business finance is largely provided by non-financial firms to their customers. In Pakistan, statistics show that the proportion of trade payables is greater than short term bank loans on the financial statements of non-financial firms (State Bank of Pakistan, 2017). The motives for extending trade credit to other businesses are debatable. One of the major motives is financing motive or helping hand motive (which may be known as financing theory) where cash-rich firms supply trade credit to financially constrained firms having limited borrowing power and are not able to get finances from banks (Carbo-Valverde et al., 2016; Elliehausen & Wolken, 1993). This practice smoothens the financial efficiency between buyers and sellers across the supply chain (Hoffman & Kotzab, 2010). Moreover, helping hand motive also mitigates the information asymmetry factor between both parties as buyers can conveniently assess the product quality before payments, and seller can gather information regarding the financial position and creditworthiness of the buyer. Therefore, during the process of demand and supply of trade credit, both parties gain significant information about each other (Paul, Guermat, & Devi, 2018).

Another motive behind extending trade credit is to value customers when direct price discrimination is not possible. In other words, trade credit can be viewed as a pricing strategy of firms, which is designed to boost demand as giving cash discounts or extending credit periods are economically equivalent for firms. In highly competitive markets, where direct price discrimination is not possible because of non-separable costs, price discriminatory practices are followed indirectly. Suppliers allow firms to make payment after due dates without penalizing the late payments. Such generous advancing terms may help profitable firms to discriminate price effectively and ultimately enhance their sales without violating market regulations (Emery, 1984; Paul & Boden, 2008).

In line with the financial motive, trade credit may also be viewed as a sales promotion tool in order to enhance future sales keeping in view the commercial benefits and transaction motives. Supply of trade credit is considered as a long term investment, like an advertisement, or relationship-specific investment to maintain long term business relationship with buyers and to secure sales over time (Nthenge, 2013). This concept was first introduced by Nadiri (1969), that demand for a product may be influenced by trade credit considering it as a non-price variable just like the advertisement.

Usage of trade credit also depends upon the market characteristics, as firms use less trade credit in more consolidated markets where few suppliers dominate the market and small firms have to comply with credit terms. In concentrated markets, the entry of new suppliers may be blocked by certain barriers and market is left with few dominating suppliers which lead to few alternatives available for trade. Consequently, buyers are dictated by those suppliers in terms of contracts, repaying agreements and conditions and in this way, buyers are controlled by the suppliers which lead to the concept of "controlling buyer advantage" (Paulsson & Muhrbeck, 2009; Petersen & Rajan 1997). This controlling buyer advantage can also be viewed as "seller opportunism" in a consolidated market where suppliers have the opportunity to increase their market share by making their buyers dependent on them by offering the small or financial constrained firms relaxed payment periods and, later on, dictate their own terms and rates. At that time, it is difficult for the buyers to switch over to other suppliers (Nthenge, 2013).

A considerable amount of work has been done in the context of developed countries especially the UK and US and the researchers have proposed a multitude of potential factors that stimulate trade credit supply. However, this area has received little attention in the Pakistani context. To extend the work of Ahmad et al. (2017), this study is adding more firms'

characteristics in order to analyze various factors that motivate firms to extend trade credit in the context of Pakistani manufacturing sector.

LITERATURE REVIEW

Researchers have linked the supply of trade credit to various motives, such as commercial motive when the desire is to enhance future sales, to helping hand motive by providing liquidity to the cash-constrained buyer (Nthenge, 2013; Teh, 2010). Price discrimination is another motive where suppliers value firms by sanctioning them a credit period instead of giving cash discounts in highly competitive markets and market power motive when suppliers have the advantage of controlling the buyers or seller opportunism in highly concentrated markets (Paulsson & Muhrbeck, 2009; Petersen & Rajan 1997; Pike et al., 2005). These studies have focused on one motive or the other, but our study is based on considering all these motives of trade credit supply in the context of Pakistan.

The concept of trade credit is at least 3000 years old, but in the nineteenth century, the use of trade credit became widespread however Nadiri's (1969) work is one of the most cited researches who estimated the factors that determined trade credit in the context of manufacturing firms of US. Later on, various researches have been conducted to examine the motives behind trade credit extension (Brennan, Maksimovic & Zechner, 1988; Ferris, 1981; Schwartz, 1974; Smith, 1987). In the following paragraphs, we discuss the motives of trade credit extension put forward in the literature. These motives include Helping hand motive, Price discrimination Motive, Commercial motives and Advantage of controlling buyer motive.

Helping Hand Motive

One of the motivations behind trade credit usage is to provide liquidity when buyers have limited financial resources for financing inventories, or suppliers have better access to finance the goods. This view of trade credit is the oldest mode of financing which is extended by suppliers to cash-constrained buyers (Atanasova & Wilson, 2003; Emery, 1987; Petersen & Rajan, 1997; Pike & Cheng, 2001). Thus, it can also be viewed as an alternate source of finance as compared to bank borrowings as it supports buyers who are facing liquidity crisis (Cunat, 2007). Furthermore, trade credit may also be considered as a strategic investment decision in order to ensure customer retention as it signals the buyer that the seller wanted to have a mutually beneficial longer-term trading relation (Cheng & Pike, 2003; Nthenge, 2013). Channeling the resources from cash-rich and profitable suppliers to buyers who are facing financially constrained, keeping in view the helping hand motive, may also promote the efficient supply chain between customers and suppliers through better communication (Boden & Paul 2014; Hoffman & Kotzab, 2010; Jain, 2001). This leads to our first hypothesis.

H1: Under helping hand motive; firms with high profits and greater access to sources of financing extends more trade credit

Price Discrimination Motive

Another motive behind the trade credit extension is price discrimination (Meltzer, 1960; Mian & Smith, 1992; Schwartz

& Whitcomb, 1979). As terms of credit are designed keeping in view the industry practices and are invariant to the credit quality of the customers, the effective prices may be lowered down using trade credit for low-quality borrowers (Smith, 1980; Petersen & Rajan, 1994). Specifically, in case of credit rationing, when the demand of the products is more price elastic in a particular segment of the market, prices can easily be discriminated using trade credit (Petersen & Rajan, 1994; Soufani, 2002). Cash-rich buyers, having better access to financial institutions are not usually motivated to accept trade credit as its implicit cost is higher than bank loans, therefore, this offer is attractive to financially constrained firms, having a high risk of default. Moreover, trade credit may generously be extended by firms having high gross margins and having the capacity to sell additional units. Such firms may use a variety of credit terms such as allow them to make payments after due dates, or not to enforce the repayment terms strictly. These relaxations are offered in anticipation of having more accounts receivables and more sales and are thus equivalent to a price reduction (Paul & Boden, 2008; Paul, Guermat, & Devi, 2018; Schwartz & Whitcomb, 1978). Hence, this study hypothesizes as following:

H2: Under the price discrimination motive of Trade Credit; firms' gross margin is significantly related to trade credit extension

Commercial Motive

When granting credit to the buyers, suppliers are actually financing the inventories of buyers as they are delivering the goods early, with an expectation of proceeds to be received in the future. Firms are making such investments by comparing the opportunity costs of alternative financing opportunities with the cost of credit offered (Paul & Wilson, 2006). Furthermore, buyers' financial position can easily be monitored by suppliers better than financial institutions and suppliers can easily monitor the day-to-day dealings of business. In this way, firms can better assess the creditworthiness of their customers and later can force them to make payments accordingly with an implicit threat of discontinuation of future supplies (Petersen & Rajan, 1997). In case of default, the worst case scenario, sellers can easily resale the repossessed goods (Ng et al., 1999; Nilsen, 2002; Petersen & Rajan, 1997). Trade credit is being generously offered by firms having a sound financial position. This commercial strategy is also followed by growing firms in order to capture more sales and market share (Soufani & Poutziouris, 2002). This leads to our next hypothesis.

H3: Under the commercial motive of Trade Credit; firms' sales growth is significantly related to trade credit extension

Advantage of Controlling Buyer

The opportunistic element of trade credit contains the strength of bargaining power between supplier and customer. As the practice of trade credit differs from market to market depends upon the market characteristics, firms of highly concentrated markets tend to offer less trade credit. Since these markets are comprised of few dominating suppliers and small firms that rely more on trade credit as it is the most convenient source of short term financing. In this scenario, the terms of

trade credit are dictated by dominating suppliers (Peterson & Rajan, 1997). Most existing trade credit literature predicts a negative relationship between trade credit supply and the seller's market power (Dass et al., 2014; Fabbri & Klapper, 2016; Fisman & Raturi, 2004). Fisman and Raturi, (2004) argue that buyers of consolidated market suppliers do not need to invest to maintain credibility with its supplier because of the prospective hold-up, which makes the supplier reluctant to extend trade credit. In the case of relationship-specific investment, supplier power is negatively associated with trade credit extension (Dass et al., 2014). Fabbri and Klapper (2016) suggest that financially strong suppliers, trading in consolidated markets, usually demand cash payments. They addressed the importance of trade credit and found that firms having low bargaining power offer more trade credit on relaxed terms in order to increase the market share. This leads to our next hypothesis:

H₄: Firms with highly concentrated markets tend to offer less trade credit

Size

Considering the commercial motive and financing theory, large firms are supposed to be more creditworthy and have the capacity to extend more trade credit to their customers in order to enhance their future sales by maintaining long term business relationship (Delannay & Weill, 2004; Pike & Cheng, 2001; Soufani & Poutziouris, 2002). This leads to the following hypotheses:

H₅: Firm size is significantly related to trade credit supply.

Liquidity

Marotta (2000) postulates an inverse association between the liquidity and trade credit supply. Firms having high liquidity ratio are not promoting sales using trade credit as it is a low-return financing mode. Moreover, Rodriguez (2006) suggests that low liquid firms tend to avoid granting trade credit to their clients as they are already in their crisis phase for paying their own obligations. This also indicates working capital solvency. This leads to the following hypotheses:

H₆: Firm liquidity is significantly related to trade credit supply

Trade Credit Supply in Previous Period

Trade credit is the spontaneous mode of financing is frequently demanded and granted by firms (Burkart & Ellingsen, 2004). It suggests that firms' previous relationship history affects the further supply of trade credit. Matching theory suggests that firms frequently extend trade credit and generate account receivables according to the timings of their payables and ultimately they match the maturities of their payables and receivables (Bastos, 2010; Diamond, 1991; Kwenda & Holden, 2014; Yang, 2011). Trade credit relationship theory (Bastos, 2010) also supports the arguments that firms do maintain long term credit relationships on the basis of past experiences with suppliers and customers and they may change their credit policy with customers if necessary depending on their history (Ahmad et al., 2017).

H₇: Current trade credit supply is significantly related to previous period credit supply

RESEARCH METHODOLOGY
Sample and Data

To achieve the objectives of testing the trade credit supply motives in the context of the manufacturing sector of Pakistan, we collected data from published reports of State Bank of Pakistan (SBP) for the period 2005 to 2016. Initially, all firms of manufacturing sector listed on Pakistan Stock Exchange (PSX) are included but later on financially distressed firms having negative equity values are excluded as they may affect the analysis. Also, after omitting firms having outliers, finally our panel data comprised of 150 firms covering the time period from 2005-2016.

Variables Measurement

Constructs used in this paper, related to bank credit and trade credit are given below in Table 1 along with their respective measurements

Table 1: Variables and their measurement

Variables	Measurements	Adapted From
Trade Credit Supply (TCS)	Accounts Receivables to Total Assets	Deloof and Jeger, (1996)
Profitability (PROF)	Return on Asset	Al-Dohaiman, (2013).
Short Term Debt(STD)	Short Term Bank Loan to Total Assets	Scherr and Hulburt (2001)
Gross Margin(GM)	Gross Profit to Sales	Peterson and Rajan, (1997)
Sales Growth (SG)	Percentage Change in Sales	Teruel and Solano (2007)
Herfindahl-Hirschman Index (HHI)	Sum of Squared Market Share in terms of Total Sales	Shahid and Abbas (2012)
Size	Natural log of Total Assets	Hackston and Milne, (1996)
Liquidity (LIQ)	Current Assets to Current Liabilities	Kim et al., 1998

Methodology

The testing of motives behind extending trade credit is analyzed using dynamic panel estimation. As our data is cross sectional-time series therefore, to analyze the relationships among all constructs, panel data analysis has been employed. In order to address the heterogeneity of data, panel data analysis is considered as an appropriate technique. Whereas, it has been usually neglected by cross-sectional or time series analysis which then leads to biased estimation. The econometric equation used for the study is mentioned below for panel data estimation:

Empirical Model

To capture the effect of previously extended trade credit, we applied the dynamic panel model by adding a lagged TCS term for estimating trade credit supply motives using the following equation:

$$TCS_{i,t} = \beta_0 + \beta_1 PROF_{i,t} + \beta_2 STD_{i,t} + \beta_3 GM_{i,t} + \beta_4 SG_{i,t} + \beta_5 HHI_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 LIQ_{i,t} + \beta_8 TCS_{i,t-1} + \varepsilon$$

The model is estimating the motives behind the extension of trade credit where dependent variable TCS is trade credit supply measured as accounts receivables to total Assets. In order to test all sources of financing for H₁, return on Asset (PROF), and Short Term Debt (STD) are used as a proxy. For H₂, Gross Margin (GM) is used as a proxy to capture the effect of price discrimination motive. Sales growth (SG) is used to test the commercial motive of TCS. For market power theory, the Herfindahl-Hirschman Index (HHI) is used as a proxy. Control variables are: firm size (SIZE) measured as the natural log of

total assets, Liquidity Ratio and lagged trade credit supply ($TCS_{i,t-1}$). In order to check the robustness, results are repeated for highly liquid firms to check if results hold true for highly liquid firms.

FINDINGS OF THE STUDY

The previous section has aimed to describe the research methodology in order to test the motives behind the extension of trade credit for manufacturing firms of Pakistan. In this regard, this section describes Descriptive Analysis, Pearson Correlation Coefficient, Unit-Root Diagnostic and Panel estimation results.

Descriptive Analysis

The mean with standard deviation, minimum and maximum values of eight variables used in the model for the period of 2005 to 2016 are given below in Table 2.

This Table shows that on average sample firms are supplying 8.87% of trade credit (TCS) along with firms having zero supply to 61.5% of maximum trade credit supply. This figure shows that manufacturing firms are heavily relying on accounts receivables. For PROF, firms are having on average 6.01% of return on assets whereas minimum value is -53.94% which shows that some sample firms are facing losses while a maximum PROF is 72.82%. Overall the sample firms are earning 6.01% PROF. For short term debt variable (STD), sample firms having a range of no short term debt to a maximum 75% debt of total assets. As far as gross profitability is concerned, on average GM (Gross Margin) is 13.23% with a minimum value of -6.601% which shows gross loss and maximum of 83.84%. For sales growth (SG), firms having an average growth of 14.8%. HHI is the proxy for capturing market power and our sample contains firms having zero market power to 99% power. For Size, the log has been taken and it has a mean value of 8.047 while a maximum of 11.657 and minimum of 3.897. On average liquidity is maintained as 1.58:1 but our sample also contains highly liquid firms having a liquidity ratio of 138.53 due to a drastic decrease in current liabilities in a particular year and minimum liquidity level is around zero for few firms in our sample. Furthermore, all variables seem fairly distributed on both sides of the mean.

Table 2: Descriptive Statistics (N=1800)

Var.	Min.	Max.	Mean	Std. Dev.
TCS	.000	.615	.089	.102
PROF	-.539	.728	.060	.096
STD	.000	.749	.195	.145
GM	-6.601	.838	.132	.300
SG	-1.000	13.320	.148	.552
HHI	.000	.990	.030	.091
SIZE	3.897	11.657	8.047	1.383
LIQ	.001	138.527	1.585	4.512

Notes: TCS is Trade Credit supply, PROF is Return on Asset, STD is Short Term Debt, GM is Gross Margin, SG is Sales Growth, HHI is Herfindahl-Hirschman Index, Size is Natural log of Total Assets and LIQ is Liquidity Ratio.

Correlation Matrix

To analyze the motives of trade credit extension, it is essential to analyze their independent relationships and associations among all variables. For this purpose, the Pearson Correlation Coefficient is used to fulfill the aim. The correlation matrix is computed by using data of 150 manufacturing firms listed on PSX with 1800 observations for the period of 12 years. Computations are presented in Table 3.

Pearson correlation is used to test the association among variables and a correlation of greater than .80 shows strong correlation and indicates the chances of multicollinearity (Gujrati, 2009). As the results show, none of our variables is strongly related to other and all variables have an almost weak correlation. Our results show that none of our value reaches the range of .80 or above so multicollinearity is not an issue to carry the further analysis

Table 3: Pearson Correlation

VAR	1	2	3	4	5	6	7	8
TCS	1							
PROF	.007	1						
STD	.06**	-.27**	1					
GM	.04	.26**	-.04	1				
SG	-.01	.13**	.01	.11**	1			
HHI	.01	.14**	-.19**	.07**	-.01	1		
SIZE	-.12**	.14**	-.08**	.14**	.04	.21**	1	
LIQ	-.03	.06**	-.14**	.05*	-.02	.01	-.03	1
TCS(-1)	.78**	-.01	.03	.04	-.05	.003	-.08**	-.02

Notes: *** significance at 0.01 level, ** significance at 0.05 level, * significance at 0.10 level. TCS is Trade Credit supply, PROF is Return on Asset, STD is Short Term Debt, GM is Gross Margin, SG is Sales Growth, HHI is Herfindahl-Hirschman Index, SIZE is the natural log of Total Assets, LIQ is Liquidity Ratio and TCS(-1) is lagged trade credit supply.

Panel Unit Root

To analyze the stationarity of data, (HHT) Harris-Harris-Tzavalis (1999) panel unit root test is used in order to avoid spurious results. The null hypothesis of HHT states that Panels contain unit roots. In our study, SIZE and HHI found to have insignificant values on the level and significant on first difference therefore in our panel regression analysis, we have used SIZE and HHI with a first difference (See Appendix 1).

Panel Estimation

This section provides the regression results by using panel data estimation for the hypotheses developed based on historical literature related to trade credit extension motives along with the discussion of results.

Table 4: Panel estimation results for TCS

Variables	Coefficients		
C	.038***	R-Square	.777
PROF	.054***	Adj R-Square	.753
STD	.062***	Durbin Watson	2.031
GM	.003	F-Statistics (Prob)	.000
SG	.005**		
D(HHI)	.095		
D(SIZE)	-.018***		
LIQ	-.002		
TCS(-1)	.430***		

Notes: *** significance at .01 level, ** significance at .05 level, * significance at .10 level. PROF is Return on Asset, STD is a Short Term Debt, GM is Gross Margin, SG is Sales Growth, D(HHI) is first difference of Herfindahl-Hirschman Index, D(SIZE) is first difference of natural log of Total Assets and LIQ is Liquidity Ratio, TCS(-1) is lagged Trade Credit supply.

Table 4 shows the results for Panel estimation for trade credit extension motives. Positive and significant values of PROF and STD suggest that cash-rich firms having strong profitability and better access to external markets do grant higher trade credit to their customers, keeping in view the helping hand motive. These results are consistent with the financing theory of trade credit supply (Boden & Paul 2014; Hoffman & Kotzab, 2010; Jain, 2001; Wilson, 2008). Price discrimination motive (GM)

has an insignificant relationship with TCS in the context of Pakistani manufacturing firms. For commercial motive, sales growth (SG) has a positive significant relation with trade credit supply which indicates that Pakistani manufacturing firms having positive sales growth allow more receivables which then may lead to increase in trade credit demand (Chee, 1999; Peterson & Rajan, 1997). The value of HHI is insignificant which indicates that a concentrated market has no impact on trade credit supply. Size has a significant negative impact on TCS which is in line with market power theory that large size Pakistani manufacturing firms have more bargaining power in buyer-seller relation and offer less trade credit to their customers. These results are consistent with the study of Teh (2010), in the context of Malaysian Manufacturing Firms. For liquidity, results found to be insignificant which proposes Pakistani firms' liquidity has no significant impact on trade credit supply. The positive relationship of TCS with TCS (-1) suggests that firms maintain a long term relationship with suppliers and supply trade credit on the basis of their previous credit relations. This finding is also supported by trade credit relationship theory (Bastos, 2010). Lastly, our R-Square value is .7767 which suggests that 77.67% variation in TCS is explained by the explanatory variables and Durbin Watson value falls within the acceptable region, therefore, the results are not affected by auto-correlation. For Robustness Checks, the estimations revealed the same significance of results for highly liquid firms except for the profitability.

CONCLUSIONS

This study investigates the various factors that motivate the firms to offer trade credit to their clients. In particular, the objective was to analyze the financing motives which include helping hand motive and commercial motive, price decimation motive, market power theory, and trade credit relationship theory. Data was collected for 150 manufacturing firms on the basis of certain criteria for the period of 12 years (2005-2016). Dynamic panel model was applied to analyze the motives along with the impact of previously supplied trade credit. The findings suggest that Pakistani firms value financing motives more and offer trade credit keeping in view the helping hand motive, commercial motive. Price discrimination and market power theory have not proved significant. These findings suggest that firms having easy access to credit markets and are financially strong with high sales growth do offer trade credit to financially constrained clients in order to finance them and securing the long term business relationships. This study also founds the evidence of strong credit relationship theory that firms demand trade credit more on the basis of their previous relationship

The motivation behind this study was to shed some light on issues related to credit management in the Pakistani environment. The capital market and economy of the country have composed and matured however little attention is given to trade credit management research despite its importance and the vital role it plays in terms of financing. The results and discussion of the findings contributing significantly to the local trade credit management literature in the Pakistani non-financial sector. The results of the study have significant implications for academics and policymakers. For instance, the motivation of the trade credit supply varies with the dynamics of firms' characteristics. Small firms offer more trade credit in order to match their payables with receivables and these credit relationships are dependent on the previous record of the customers. Therefore, firms have to carefully establish their credit policies and it should also be noted that trade credit supply policy is developed in accordance with the firms' trade credit supply policy to avoid any liquidity crunch.

For future analysis, trade credit demand may also be included to confirm the matching hypothesis. Further, the inclusion of buyers' characteristics and pattern of repayments can make this study more helpful for policymakers but the difficulty in accessing this data set constraint us to add these variables in our analysis. The macro-economic variable like inflation or GDP may also be included to enhance the effectiveness of these relationships.

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Appendix A
Table A1: Panel Unit Root Test

Variables	Harris-Harris-Tzavalis (1999)
Ho: Panels contain unit roots	
GM	.210***(.000)
HHI	.761(.329)
LIQ	.624***(.000)
PROF	.267***(.000)
SG	-.074***(.000)
SIZE	.823(.998)
STD	.451***(.000)
AR	.558***(.000)
AFTER FIRST Difference	
D(SIZE)	-.143***(.000)
D(HHI)	-.301***(.000)

Table A2: Panel estimation results for TCS

Variable	Coeff.	Std. Error	t-Stat.	Prob.
GM	.003	.005	.610	.542
D(HHI)	.095	.073	1.292	.197
LIQ	-.002	.001	-1.248	.212
PROF	.054	.017	3.098	.002
SG	.005	.002	2.224	.026
D(SIZE)	-.018	.005	-3.380	.001
STD	.062	.014	4.279	.000
ACR(-1)	.430	.023	18.523	.000
C	.038	.005	8.430	.000

Effects Specification

Cross-section fixed (dummy variables)

R-squared	.777
Adjusted R-squared	.753
Durbin-Watson stat	2.031