Trade Credit as an Alternative Source of Finance and its Role in Firm Performance and Stock Returns Predictability: Evidence from Pakistan.

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DECLARATION

Date: January 26, 2020

I, **Ammara Mubashar** Daughter of **Mubashar Ata** certify that the thesis entitled, **"Trade Credit as an Alternative Source of Finance and its Role in Firm Performance and Stock Returns Predictability: Evidence from Pakistan"**. Being handed over to the competent authority has not already been submitted or published and shall not in future be submitted by me for obtaining any degree from another university or institution.

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DEDICATION

This thesis is dedicated to:

My mother,

a constant support to me throughout
my all phases of life, who always stands
beside me during entire academic and professional
career and always shows me the
brighter side of life.

Thank you for teaching me early
in life that knowledge is the best ornament
and it is actually a joy forever.

Thank you for being my pillar of strength
and if today I stand somewhere in my life,
it is only because of you

"Ammi"

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Lots of Love & Best Regards

Ammara Mubashar

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LIST OF ABBREVIATIONS

2SLS	2-Stage Least Square
ACC	Accruals
DR	Debt ratio
DSO	Days Sales Outstanding
FE	Fixed Effect
GM	Gross Margin
GMM	Generalized Method of Moment
HHI	Herfindahl-Hirschman Index
HML	High Minus Low
IE	Interest Expense
INV	Inventory
LEV	Leverage
LIQ	Liquidity Ratio
MKT	Market
NTCR	Net Trade Credit Ratio
OLS	Ordinary Least Square
PROF	Profitability
RG	Revenue Growth
SMB	Small Minus Big
STD	Short Term Debt
TCD	Trade Credit Demand
TCS	Trade Credit Supply

ABSTRACT

This study aimed to examine various aspects of trade credit including the motives behind trade credit supply, use of trade credit as an alternate source of short term finance, the consequences of trade credit extension and lastly the impact of supplier's information advantage on future stock returns. To achieve the first objective i.e. motives of trade credit extension, this study employed a dynamic panel estimation model and found that firms are offering trade credit while considering the commercial motives and helping hand motive, whereas large firms are found to be reluctant to supply trade credit. The concentrated markets' setup does not promote and grant trade credit. This study also examined 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. Furthermore, the results of substitution hypothesis verified the complimentary association between trade credit demand and short term bank loans which suggest that firms can access short term loans easily by demanding trade credit from suppliers and the results obtained are found to be more profound for small firms. The impact of previous period trade credit was also examined and found to have a positive relationship with trade credit demand which suggests that relationship history matters for demanding additional trade credit. Further, the consequences of trade credit extension in terms of late payment collection are also analyzed by incorporating Two-Step System GMM. While using Days Sales Outstanding (DSO) as a proxy for measuring late payments periods, this study proved that DSO is not an appropriate proxy in the context of Pakistan. The reason may be because each industry has different DSO benchmarks hence the generalization of DSO is not proved in the context of the Pakistani manufacturing firms. Lastly, the informational role of trade credit in predicting future stock returns of firms in the context of Pakistan was analyzed by employing Fama and French three-factor model (1992), along with Fama Macbeth regression (1973). The findings suggest that trade credit supply signals the information that the supplier has about the borrower and this information is gradually and positively translated in the market. For the pricing of risk factors, Fama Macbeth regression results provided little help in predicting future stock returns due to weak explanatory powers. The results of the study have significant implications for academics and policymakers. For instance, the motivation of trade credit supply varies with the dynamics of firms' characteristics and while adjusting trade credit policies, managers should re-visit their past relationship history of trade credit with their clients.

Keywords: Trade credit; Dynamic panel estimation model; Commercial motives; Helping hand motive; Substitution hypothesis; Two-Step System GMM; Days Sales Outstanding; Fama and French three factor model; Fama Macbeth regression.

JEL Classification: G30; G31; G32

CHAPTER I

1. Introduction

1.1 Background of the Study

In a financially weak operational system with tightened monetary and debt policies, companies have to pursue different sources of short term financing and trade credit is one such source (Olusola & Olusola, 2012). Trade credit is a financial transaction in which a firm's goods or services are sold and simultaneously credit is extended to the customer for purchasing the goods. Alternatively, it can be viewed as a loan that is supplied by the seller against product sales (Ferris, 1981; Chou & Lin, 2015). In the intermediate goods market, producers usually offer contractual payment terms with credit options (e.g., 2/10, net 30). Payment terms differ considerably across firms and industries. The interest rates embedded in some payment terms are so high that many corporate finance textbooks have highlighted the heavy expense of using trade credit (Lee & Stowe, 1993).

Trade credit involves the supply of goods and services on a credit with payment due in the future, thus creating a gap between goods supplied and payment made. Instead of immediate demand for cash payment after-sales transactions, payment on late date is being allowed by the seller. This contract is enforced with an aim to maximize profit thus having a component of risk which a firm deliberately undertakes and any decision on providing trade credit means additional risks that a company takes (Siekelova et al., 2017).

The investment in trade credit represents a significant portion of a firm's assets, while trade credit extension is a significant source of funds for most businesses (Baños-Caballero et al., 2014). Generally, small firms grant more trade credit if banks facilitate the loan provision because small firms (SMEs) with easy access to bank credit, offer more trade credit to their customers (Tsuruta, 2015). The trade credit channel is availed by businesses for managing growth. Financially stronger firms supply more trade credit to financially vulnerable small firms in the aftermath of the financial crisis (McGuinness and Hogan, 2016). Moreover, financially constrained firms from all sectors prefer trade credit over bank financing. But larger firms, having easy access to bank credit do not rely on trade credit because of their better capacity to acquire funds from capital markets and their improved capacity of internal cash generation (Santos et al., 2012).

Suppliers are more encouraged to provide trade credit since they have a comparative advantage over banks in enforcing credit contracts, assessing the creditworthiness of buyers and acquiring buyer's information (Hasan & Habib, 2019). Moreover, buyer's reputational capital may also motivate suppliers to supply trade credit (Zhang et al., 2014). This argument proposes that trade credit supply also aids to maintain long-term business relations with customer. These business relations ensure not only continued sales agreements, but also minimize the cost of information collection and evaluation (Kennett, 1980).

The significance of trade credit is also noteworthy from both micro- and macroeconomic perspectives as it is one of the most major sources of working capital for Pakistani firms. It facilitates the liquidity issues and provides financial help to the firms

of Pakistan that face difficulty in acquiring bank loans. Trade credit also supports the firm in accelerating the market value as it is considered as an indicator of firm growth (Afzal, 2018). Moreover, it also signals the buyers' future performance as the will of trade credit extension is characterized with the underlying risk of buyers' default. Therefore, it indicates that lender must have the required information about buyer (Biais & Gollier, 1997).

1.2 Theoretical Background

In a financially inefficient working environment, contract enforcements are usually insecure, information is scarce and financial institutions offer limited credit to the businesses (Al-Dohaiman, 2013). These challenges force businesses to approach alternative financing options along with formal sources and they end up with trade credit financing. Trade credit contracts are frequently established between sellers and buyers having asymmetric bargaining positions and are backed by various motives that include financing motive or helping hand motives having certain credit terms. As credit terms may be a problem, particularly for smaller firms, so they end up with late payment which is often cited as a factor that causes financial distress for both suppliers and users.

Nadiri (1969) was the pioneer who paid attention to develop an optimal model of trade credit based on the theory of the firm. The model specifies that the opportunity cost involved in extending or receiving trade credit through the demand of product may be influenced by trade credit considering it as a non-price variable just like advertisement. Long (1993) recommend that with the upsurge of corporate defaults, it has

turned out to be increasingly evident that the management of assets is as significant as the management of firm's liabilities. An efficient part of a company's time and assets is devoted to manage the working capital in general and trade credit in specific as it is a significant segment of working capital.

Trade credit extension, if handled carefully, is a typical practice of doing business and is considered as a more refined form of loans by listed firms (Zhu & Jiang, 2009). Financially constrained firms that are operating in developing countries with underdeveloped markets and legal systems, consider trade credit as a last resort of financing (Peterson & Rajan, 1997). Firms are motivated to extend trade credit for two broad reasons. First is operational motivation for the sake of expansion of market share and second is financial motivation. The former is supported by transaction theory which suggests that trade credit aids in reducing both the customer requirement of maintaining high liquidity and the transaction costs (Schwartz, 1974). The latter highlights a special attribute supported by signaling theory where trade credit providers collect internal information about their customers' well-being which is similar to the information acquired by banks. This information further signals about borrower's future performance to other lenders which may also be translated in stock market.

1.2.1 Signaling Theory

Following the financial motivation behind trade credit extension, Biais and Gollier (1997) introduced a screening process which is adopted by suppliers to screen their borrowers as they have an information advantage over banks and then the provision of trade credit signals the creditworthiness of the borrowers. This trade credit provision sends a strong

signal about the credit worthiness of the buyer to the bank which stimulates the banker to sanction more credit. Furthermore, the acceptance of credit risk of customers by the seller may also signal that the seller may have a positive prediction about the future performance of the firm (Aktas et al., 2012). This signaling model shows how trade credit transfers private information about borrowers to other lenders. The central question arises that if private information signals about borrower's future performance to other lenders, then does this information advantage also exist in stock markets and can predict future stock returns of the firms? In this study, we are conducting the estimations on limited attention of investors to the superior information of suppliers in the context of Pakistan by incorporating trade-credit ratio as a measure of suppliers' information advantage.

The use of trade credit also supports the financially constrained firms when they apply for bank loans as it signals the information to the bank about the creditworthiness of borrowers (Biais & Gollier, 1997). This signaling role of trade credit also helps firms in acquiring reputation, alleviating adverse selection, (Antov & Atanasova, 2007) diminishing moral hazard problems, information asymmetry and may also prompt the banks to increase lending limit (Burkart & Ellingsen, 2004). Stiglitz (2002) explained that information asymmetries occur when "different people know different things." Because some information is private, information asymmetries arise between those who hold that information and those who could potentially make better decisions if they had it. Stiglitz (2000) highlights two broad types of information where asymmetry is particularly important: information about quality and information about intent. In the first case, information asymmetry is important when one party is not fully aware of the

characteristics of another party. In the second case, information asymmetry also is important when one party is concerned about another party's behavior or behavioral intentions (Elitzur & Gavious, 2003). Petersen and Rajan (1997) suggest that the problem of information asymmetry seems to be solved by trade credit on the worth of the borrower. Furthermore, Cuñat (2006) found that the use of trade credit also encourages companies to maintain their information standards which may also help them in accessing bank loans as it improves the opinion about the creditworthiness of such companies and thus facilitates bank credit granting. From this perspective, we may assume the complementary relationship between these two financing sources. In this aspect, the trade credit supplier has an advantage as compared to the financial institutions, as they can easily monitor and gather the information about the borrowers. Thus, asymmetric information theory is crucial to recognize the reality of trade credit as a complement or substitute to the financial system (Stiglitz & Weiss, 1981).

1.2.2 Transaction Theory

Trade credit is a mode of finance that distinguishes the payment from the uncertainty lying in the exchange of goods. Ferris (1981) presents a transaction theory of trade credit supply from the perspective of both parties for economizing the joint costs of exchange along with achieving various motives that may financially benefit the supplier of trade credit. Such motives for extending trade credit to other businesses are debatable. One of the major motives is financing motive or helping hand motive 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). In a similar vein, distressed firms rely relatively more on supplier financing as a substitute for other forms of external capital than non-distressed public firms. This latter finding is consistent with Molina and Preve's (2012) and Abdulla et al., (2017). This practice brings financial efficiency between buyers and sellers across the supply chain (Hofmann & Kotzab, 2010). Moreover, helping hand motive also mitigates the information asymmetry between both parties, as buyers can conveniently assess the product quality before payments, and the 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, et al., 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 to enhance future sales while keeping in view the commercial benefits and transaction motives. Supply of trade credit is considered as a long term investment, like

advertisement, or relationship-specific investment to maintain long term business relationships with buyers and to secure sales over time (Nthenge, 2013).

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 the 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 through offering the small or financial constrained firms relaxed payment periods and later on, they start to dictate their terms. In such circumstances, it becomes problematic for buyers to change the suppliers (Nthenge, 2013).

1.2.3 Knight's Theory of Profit

Knight (1921) proposed Knight's Theory of Profit as a reward for not bearing risk but for uncertainty. In simple words, for businesses, it is the residual return for bearing the uncertainty in business and that various risks may affect the returns and performance of the firm. In the context of trade credit, the inbuilt risk associated with trade credit is of

late payments that may lead to bad debts, or may also result in increased collection cost and questions the efficiency of the credit department.

Management of payment collection is the most critical job of trade credit management. Effective collection efforts with sufficient resources are required to support the working capital requirements otherwise, it may result in distressing the liquidity position of a company and the significance of adequate liquidity for any business needs no special emphasis (Zainudin, 2008). For settling off the obligations, an adequate level of liquidity must be ensured and maintained by firms so that funds would be readily available. Basically, the existence or demise of any business depends upon the sufficiency of liquid assets, along with the efficient working capital management (Nurein & Din, 2018). Moreover, trade credit supply also provides the monitoring advantage which means that matters related to the collection of credit should be monitored to empower firms to comprehend and better deal with their trade credit.

Furthermore, late payments received by the supplier of trade credit would also force the firm to increase working capital by raising financing from debt (Paul & Boden, 2011). Debt financing would result into high-interest expenses, low profits, and reduced borrowing capacity hence needs to issue more equity which dilutes the existing ownership. The ultimate consequence of late payments would not only be the extension of the cash conversion cycle but also increasing the length and amount of trade credit from suppliers (Tsuruta, 2012). Therefore, firms should be cautioned that extension of trade credit for business expansion may lead to a liability generation if payments are not forthcoming, and subsequently turn into bad debts which can create a vicious cycle in the

company's supply chain (Teh, 2010). Zainudin, (2008) claimed that the turnover or the frequency of reinvestment of capital determines profitability whereas slow collection would hinder the frequent turnover as the use of capital is not recommended when collections of payments are late or slow. Therefore, considering the performance of the firms, the collection period is a significant factor, which is often neglected or poorly managed since late payments or non-payments by customers can inversely affect the operations of business which are not limited to any particular industry or country.

1.3 Gap Identification

The compelling factor that prompted to go for this investigation is that the informational roles of trade credit which are limited to analyzing the aspects of trade credit and can be translated in various contexts. For instance, Rasheed and Kouser, (2020) analyzed corporate governance and stock price informativeness in a unique setting of an emerging market which are usually characterized by poor governance and information environment. Moreover, creditor as a stakeholder gains internal information through public and private channels, may also affect stock price (Liu & Hou, 2019). Nevertheless, there is limited literature that focuses on the information disclosure role of creditor. The novelty of the present study is to analyze the informational role of trade credit in predicting stock returns, using Accruals and Trade Credit Ratio by employing asset pricing models. At this point, it may be inferred that the literature on asset pricing model using trade credit for predicting stock returns is rather limited. Therefore, information accompanied by trade credit about firms' future performance can also be translated into the stock market but often ignored by investors. As firms demand

trade credit for different purposes and in Pakistan it is considered as a potential substitute to bank loans (Mubashar et al., 2018) therefore, it blurs the stock market signal content. When this information content is ignored by the investors about customer firms, then a delayed market response is expected about future sales growth of firms and stock return predictability (Goto et al., 2015). Moreover, scarce literature analyze informational role of trade credit in general and stock returns predictability in particular (Agostino & Trivieri, 2014; Goto et al., 2015; Cao, et al., 2018). However, the main focus of these studies is future firm performance, borrowing capacity or investment quality.

Furthermore, considering the different financing modes and behaviors in different countries where financial institutions, banking systems, and capital markets are fully developed, very limited literature is available about this source of financing for developing country. To extend the work of Ahmad et al. (2017) and Chen et al., (2019), this study is adding more firm specific characteristics along with dynamic model to analyze both trade credit demand and supply side in the context of the Pakistani manufacturing sector. In the context of Pakistan, the substitution/complementary relationship between short term bank loans and trade credit demand along with motives of trade credit extension and their impacts on performance are yet to be explored.

1.4 Problem Statement

Trade credit is an important source of finance for developing economies, where businesses get limited support from the financial institutions (Ge & Qiu, 2007). Despite the significance of trade credit, its role and use has been paid limited attention. Similarly,

it is still debatable in finance literature that whether demand for trade credit is complementary to bank loans or it is a substitute, as it varies from country to country. Furthermore, active collection of payments is an essential component for managing trade credit and without incorporating effective payment collection effort, there will be a shortage of funds and resources available for supporting the working capital requirements which may distress the liquidity and overall financial position of a company. Therefore, issues that are related to trade credit collection need to be carefully investigated to allow companies to better manage and monitor their trade credit. Lastly, trade credit is used for various reasons such as price discrimination or transaction cost reduction but such motivations of trade credit demand can blur the signal content. These credits are granted by suppliers after careful screening or monitoring of buyers' business. If sufficient attention is paid to the information which a supplier has about its customer firm, then the market responses may be predicted by such information of trade credit about the future outlook of the business such as sales growth, or future stock returns.

1.5 Research Questions

Based on the issues raised in the problem statement, this study attempted to answer the following questions:

1. Does helping hand motive of trade credit influence trade credit extension in the context of manufacturing firms of Pakistan?
2. Does price discrimination motive influence trade credit extension in the context of the Pakistani manufacturing firms.

3. Does commercial motive of trade credit influence trade credit extension in the context of manufacturing firms of Pakistan?
4. Does trade credit offer is influenced by concentrated markets?
5. Does trade credit demand constitute a key alternative to short term financing?
6. Do the consequences of trade credit affect the performance of manufacturing firms in Pakistan?
7. Does informational role of trade credit exist in the stock market of Pakistan?

1.6 Objectives of the Study

Following were the objectives of the study:

1. To empirically test the impact of helping hand motive on trade credit extension in the context of the Pakistani manufacturing firms.
2. To test the impact of price discrimination motive on trade credit extension in the context of the Pakistani manufacturing firms.
3. To empirically test the impact of commercial motive on trade credit extension in the context of manufacturing firms of Pakistan.
4. To empirically test the impact of trade credit usage for concentrated market in the context of the Pakistani manufacturing firms.
5. To analyze the substitution/complementary relationship between trade credit and short term bank loans.
6. To analyze the impact of late payments on the profitability of manufacturing firms in Pakistan.

7. To empirically test the informational role of trade credit in predicting firm's stock returns.

1.7 Significance of the Study:

Recent statistics published by State bank of Pakistan show that trade credit accounted for 32% of current liabilities in 2019 for listed companies on the Pakistan Stock Exchange. The comparable figure of short term bank credit was 27% (State Bank of Pakistan, 2019). These statistics show that the Pakistani firms are relying on both sources of short term financing for smoothly carrying out their operations and trade credit is as important as bank credit. The discussion on choices of finance between short term bank credit and trade credit has not been developed for the Pakistani firms and thus it justifies the need for analysis in the Pakistani market where bank loans are easily accessible to state-owned firms or firms having good relationships with banks (Ahmed et al., 2015). Moreover, the extensive use of trade credit supply is also witnessed from statistics published by the State bank of Pakistan which is about 39% of current assets in the year 2019. Therefore, this study also contributes to empirically testing the motives and consequences of trade credit extension and the role played by the manufacturing sector in extending and receiving trade credit in Pakistan.

Moreover, considering the issues related to trade credit, this study also analyzes the consequences of trade credit in the form of late payments collection and its impact on profitability by incorporating additional variables. Further, the supplier's information advantage is studied in the context of the developed market i.e. the US where markets are well developed and found that the impact of the information held with the supplier is

translated in stock market and hence generates stock return predictability (Goto et al., 2015). Extending their implications, this study attempted to find whether such information advantage does exist in the Pakistani developing market or not?

This study also introduced a novel aspect in the econometric exercise by adding a special feature of lagged terms of dependent variables by using the dynamic panel model for estimating the role of relationship history as trade credit could serve as a buyer–supplier coordination mechanism (Seifert et al., 2013). Such a feature was introduced by Benishay (1968) and lately by Huang et al., (2011) who re-activated this legacy. This is of interest not only to academics but also to creditors, firm managers, and owners.

1.7.1Theoretical Significance:

While this study adds a valuable contribution to the trade credit literature as a vital mode of financing for financially constrained firms that have limited access to financial markets, it also contributes to the literature of the trade credit supply side and stock returns predictability.

For stock returns predictability model, informational role of trade credit was used by Goto et al., (2015) to predict sales growth and stock returns and found strong prediction for services industry. It is, however, pertinent to mention that use of trade credit is more profound for manufacturing sector. The study of Goto et al., (2015) used Fama Macbeth to predict sales growth and stock returns. To distinguish our work, we employed the traditional asset pricing models, and also proposed a new multi-factor model by incorporating two new factors –accruals and trade credit ratio. Moreover, the

study also contributes in the area of knowledge by empirically testing the applicability of the five factor model proposed by Fama and French (2015) for determining risk adjusted returns in the context of developing country such as Pakistan, and by applying the Fama and Macbeth (1973) through two pass regression methodology.

Furthermore, researchers have associated the transaction motive to trade credit extension which is a desire to realize economies in cash management and to a financing motive, a desire to finance the financially constrained firms because credit availability from other sources, particularly from banks, is limited. Previous studies have explored one or the other of these motives (Elliehausen & Wolken, 1993). This study has explored all the possible motives behind trade-credit extensions along with the model of trade credit demand. Similarly, this study not only explores the motives behind trade extension but also investigates the consequences of granting trade credit i.e. late payments from customers. For this purpose, a different measure is incorporated for dealing with late payment from customers that allows the application of objective estimation, as compared to previous studies that used survey and interview methods around the globe which are more subjective by nature (Amoako, et al., 2020).

1.7.2 Practical Significance:

Trade credit is considered as a sustainable resource not only for small businesses in crisis but it is equally vital throughout the entire life cycle of businesses. Previous studies show that companies' financial needs vary from stage to stage but trade credit is a necessity at all stages of business life whether it needs to start, grow or sustain. This study implies

that demand and supply of trade credit should be adjusted keeping in view the growth and financing needs, market power, operating cash flows, creditworthiness, and unsold stock. Secondly, considering the linkage of financial markets and information asymmetry which can increase the firms' trade credit demand (Berger & Udell, 2006), managers should prepare and use trade credit agreements transparently with their suppliers for efficient management of costs that are associated with the financing sources (Yazdanfar & Öhman, 2017).

Furthermore, our contribution in regards to payment behavior and trade credit is to consider late payment behavior before giving trade credit to customers, to monitor transaction costs relating to giving trade credit and performance of debt collection staff. The significance of payment collection cannot be ignored as it is a serious problem resulting from debt default which stems from non-payment by firms hence leading to financial difficulties (Lubega, 2020).

1.7.3 Contextual Significance:

The present study is embraced with the motivation to reveal insight into various aspects of trade credit management in the context of Pakistan. After more than half a century since gaining independence, major transformations and growth has been observed in our capital markets and economy, yet little attention is paid to short term mode of finances. Manufacturing sector is the second biggest sector of the economy of Pakistan after agribusiness division and it represents 13.8% of GDP (Government of Pakistan, 2018-19). Being a major contributor to economy of Pakistan, this sector needs to be analyzed at all levels. Since, manufacturing sector is the extensive user of trade credit in terms of

both demand and supply and credit redistribution is the common practice by listed firms of developing country, therefore, the findings of this study significantly contribute to the trade credit management literature in the context of the Pakistani manufacturing sector.

Moreover, to the best of our knowledge, the informational role of trade credit in predicting stock returns, using accruals and trade credit Ratio is not studied either in isolation or the combine effect of both to find out prices of financial assets in Pakistani equity market. As, Pakistan is a developing country and such markets' asset pricing dynamics are quite different from developed markets and it is also expected that Pakistani equity markets suffers from market imperfections and may also experience severe asymmetric information problem. Therefore, this study contributes to the existing literature of multi-factor asset pricing model as Pakistani market seems more relevant and interesting for such analysis which may further help to enhance our understanding of the asset pricing models.

In the area of trade credit management research, its significance regarding financing cannot be ignored as statistics show that the Pakistani businesses are relying on such short term mode of finances.

1.8 Organization of Thesis

The remainder of the thesis is organized as follows:

Chapter 2: Provides the relevant literature along with the development of hypotheses

Chapter 3: Discusses the details of methodology employed, data description and collection method, variables measurements

Chapter 4: Describes results and analysis.

Chapter 5: Presents the results and discussion along with limitations of the study, policy implications, and future research directions.

CHAPTER II

2. Literature Review

This chapter encapsulates the review of previous theoretical and empirical pieces of evidence regarding trade credit financing in the following order:

Section 2.1: Presents a brief historical background of trade credit

Section 2.2: Presents the review of previous studies discussing the motives behind trade credit extension.

Section 2.3: Presents mixed reviews regarding bank finances that may be a substitute for trade credit.

Section 2.4: Presents the consequences of trade credit extension in terms of late payments and the impact on performance of firms.

Section 2.5: Presents the review of studies related to trade credit and stock returns predictability.

Section 2.6: Presents the Hypotheses development of the studies along with theoretical models of the study.

In the literature of financial management, trade credit demand from a buyer/users perspective is discussed as accounts payable financing, (Brigham et al., 1999) and from the supplier's perspective, the supply/extension of trade credit is referred mainly to the accounts receivables financing. The extension of credit is recorded as the amount outstanding under the head of current assets in the account receivables in the seller's books of accounts whereas trade credit demand is recorded as the amount payable under the head of current liabilities in the buyers' books of accounts. This mode of financing is the major source of short term finance and is combined with credit terms generally stated as net terms along with discounts for quick payment.

2.1 Historical Background

Trade credit usage became more prevalent in the eighteenth and nineteenth centuries. Later, one of the most preferred credit researches is Nadiri's (1969) work, where factors affecting trade credit are estimated in the context of US manufacturing firms. Nadiri (1969) confirmed that trade credit investment is like investment in capital assets, where market share is increased with the contribution of both parties to the firm's value. Moreover, sales of firms also increase with trade credit extension (Abuhommous, 2017; Summers & Wilson, 2002). A transaction theory presented by Ferris (1981) suggests one of the motives for extending trade credit from the viewpoint of business partners to streamline the common expense of trade. It is found that the demand for goods and money is generated by firms when delivery time is uncertain. Trade credit is observed as a tool that distinguishes the payment from the uncertain delivery of goods. This forewarning of timings of payments and credit grant helps the traders to maintain

precautionary money holdings and also promotes net money accumulation by effective credit management.

Frank and Maksimovic (2004) discovered that suppliers would like to supply trade credit to such buyers who are financially constrained for maintaining and promoting long-term business relationships with them. In the context of underdeveloped financial markets, suppliers extend trade credit to have liquidity reserves (Emery, 1984). Moreover, in less competitive markets where suppliers enjoy strong market power, they make maximum efforts to increase their sales with higher profit margins. Such firms also promote the extension of trade credit as a marketing strategy (Ahmad, et al 2017). On the other hand, in competitive markets where direct price discrimination is not possible, suppliers find different ways to capture the market by offering trade credit. Such offers are made by bearing liquidity risk and trusting buyers (Amoako, et al., 2020).

2.2 Motives of Trade Credit Extension

Numerous empirical researches have indicated several motives for extending trade credit. According to Schwartz (1974), trade credit is mostly offered by those suppliers who have easy access to financial markets and is offered to those customers who are financially constrained and have limited access to short term bank loans. Keeping in view the product quality, Deloof and Jegers (1996) indicate the inspection aspect of trade credit extension as buyers get enough time to check the quality of the products before the payment, and this is relatively confirmed by their research results. The Product quality perspective of trade credit extension is also verified by Psillaki and Eleftheriou, (2015)

who state that the quality of the products is also assured by granting trade credit to the buyers. The credit terms offered to buyers also give signals about product quality. Moreover, the duration of the credit period also depends upon the nature of goods as perishable goods require less time for verification as compared to durable goods.

Trade credit extension is also considered as an exclusive investment in managing trade relationships along with the reputation of buyers. According to Wilson (2008), 'trade credit supply is an important tool for maintaining good trade terms with customers. For instance, regular trading with the same buyer establishes a strong reputation and helps in building long term and stable trade relationships with customers'. Moreover, this long-term relationship depends on the stay of the buyer in the business (Ng et al., 1999). As suppliers are interested to support their financially constrained buyers by extending trade credit but this support depends on the information acquired by the supplier about the buyer's financial challenges and a keen differentiation between the good or bad buyers.

Cunat (2006) discusses that frequent switching of buyers and suppliers is an expensive investment from both ends but for certain industry fields, therefore customers are bound to clear their trade debt and suppliers also would like to supply trade credit to the customers who are experiencing liquidity problems. This long term relationship also benefits the suppliers in fulfilling customers' credit demand to financially support the production period of their customers (Paul & Wilson, 2007).

Supply of trade credit is linked to the various motives such as commercial motive when the desire is to enhance future sales, to a helping hand motive by providing

liquidity to 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 analyzing all these motives of trade credit extension in the context of Pakistan. In the following paragraphs, we discussed 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.

2.2.1 Helping Hand Motive

One of the motivations behind trade-credit extension 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, 2004; Emery, 1987; Petersen & Rajan, 1997; Pike & Cheng, 2001). Thus, it can also be viewed as an alternative source of finance as compared to bank borrowings as it supports buyers who are facing a liquidity crisis (Cunat, 2006). Moreover, trade credit is also considered as a strategic investment decision to ensure customer retention as it signals the buyer that the seller wanted to have a longer-term trading relation which is mutually beneficial for both parties (Cheng & Pike, 2003; Nthenge, 2013). Trade credit investment depends upon the availability of funds for sellers. Firms having access to external financing from capital

markets or having strong financial positions and profitability, extensively make investments in trade credit. Firms earn more profit if they are investing in accounts receivable more than the industry average by extending more trade credit. On contrary, financially challenged firms are hesitant to supply trade credit, which results in loss of good investment opportunities in trade credit and ultimately under-investment problems arise due to loss of sales (Almeida & Campello, 2007; Abuhommous, 2017). Channeling the resources from cash-rich and profitable suppliers to buyers who are 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; Hofmann & Kotzab, 2010; Jain, 2001; Cosci,et al., 2020). This leads to our first hypothesis.

H_1: Under helping hand motive; firms which are profitable and have greater access to external sources of financing extend more trade credit.

2.2.2 Price Discrimination Motive

Trade credit can also be viewed as a component of firms' pricing strategy because it helps the firms in changing the selling price according to the change in credit terms considering the financial position of the buyers (Schwartz 1974). Generally, trade credit allows suppliers to expand market share by relaxing the credit terms or by granting more cash discounts. In this way, firms bear the cost of financing the financially constrained customers or those making late payments (Brennan et al., 1988). Garcia-Teruel and Martinez-Solano (2010) confirm the evidence for price discrimination theory in the

context of European firms, where they found that firms support their decreasing sales by offering more trade credit. Thus, without violating price discrimination law, firms tend to raise the implicit price of the goods to financially constrained customers (Abuhommous & Mashoka, 2018).

Another motive behind the trade credit extension is price discrimination (Meltzer, 1960; Mian & Smith, 1992; Schwartz & Whitcomb, 1978). As terms of credit are designed according to the industry practices and do not vary to the credit ratings of the customers but for low-quality buyers, the effective prices may be lowered down using trade credit (Petersen & Rajan, 1995). Specifically, in the case of credit rationing, when the demand for the products is more price elastic in a particular segment of the market, prices can easily be discriminated using trade credit (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 sale additional units. Such firms may use a variety of credit terms such as allowing the buyers 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 price reduction (Paul & Boden, 2008; Paul et al., 2018; Schwartz & Whitcomb, 1978). Hence, this study hypothesizes as following:

H_2: Under the price discrimination motive of Trade Credit; firms' gross margin is significantly related to trade credit extension.

2.2.3 Commercial Motive

When granting credit to the buyers, suppliers finance the inventories of buyers as they deliver the goods early, with an expectation of proceeds to be received in the future. Firms make 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 the case of default, the worst-case scenario, sellers can easily resale the repossessed goods (Ng et al., 1999; Petersen & Rajan, 1997; Nilsen, 2002). Trade credit is being generously offered by firms having a sound financial position. This commercial strategy is also followed by growing firms to capture more sales and market share (Soufani & Poutziouris, 2002).

Sale volume can also be increased by sellers if a reasonable inspection period is allowed to customers for assessing the goods that are in bulk and cannot be assessed at the time of sale. In this way, trade credit is used as a tool to grow firms' sales keeping in view the commercial motive (Nadiri, 1969; Abuhommous, 2017). Moreover, transactions on credit boost the sales which lead to an increase in the firm's current assets level Paul et al., 2018). For financing the growth of the business, growing firms supply more trade credit (Boden & Paul, 2014; Summers & Wilson, 2002). Nevertheless, as a marketing

tool, firms with diminishing sales use trade credit to boost their depressed sales (Delannay & Weill, 2004). This leads to our next hypothesis.

H_3: Under the commercial motive of Trade Credit; firms' sales growth is significantly related to trade credit extension

2.2.4 Advantage of Controlling Buyer

Trade credit extension is usually perceived as a source of competitive advantage, as suppliers provide more trade credit financing in a competitive market to capture more market share. This theory is contradicted by the finding of Chod et al., (2019) who found that in a competitive market, suppliers do offer trade credit but that depends on the proportion of the retailer's expenditure. If the retailer's proportion is high then suppliers offer more trade credit or allow more credit transactions. The opportunistic element of trade credit contains the strength of bargaining power between the supplier and the customer. As the practice of trade credit differ from market to market and 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 rely more on trade credit as it is the most convenient source of short term financing. In such a scenario, the terms of trade credit are dictated by the dominating suppliers (Peterson & Rajan, 1997). Most of the 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 and Raturi, (2004) argue that buyers of consolidated market suppliers do not need to invest to maintain credibility with their supplier because of 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 to increase the market share. This leads to our next hypothesis:

H_4: Trade credit is less offered by firms of highly concentrated markets

Considering the commercial motive, large firms are perceived as more creditworthy having more capacity to extend trade credit for enhancement of their future sales by maintaining long term business relationships (Delannay & Weill, 2004; Pike & Cheng, 2001; Soufani & Poutziouris, 2002). Moreover, big firms are having more capacity of granting trade credit as being more creditworthy and already dealing with high transaction volume related to cash sales (Boden & Paul, 2014). Big firms are considered as highly liquid firms but Marotta (2000) and Rodriguez (2006) postulate an inverse association between the liquidity and trade credit supply i.e. firms having high liquidity ratios are not promoting sales using trade credit as it is a low return financing mode. Nevertheless, Paul et al. (2018) found that highly liquid firms tend to offer more trade credit regularly to secure long-term business relationships by financing the customers' inventory. Niskanen and Niskanen (2006) explored that firms having sound current asset to total asset ratio tend to use more trade credit. Ng et al. (1999) claimed that trade credit is offered from highly liquid firms to low liquid firms. Emery (1984) suggests that highly liquid firms will supply TC as an alternative to short term investments in marketable

securities. On the other hand, an inverse relationship is also found between liquidity and trade credit supply which suggest that firms support their falling sales by offering more trade credit (Bougheas et al., 2009)

The size of firms also affect credit supply picks as big firms do supply and demand more trade credit from their trading partners. And this leads to increase in the levels of accounts receivable and accounts payable with the size of the firm (Bougheas et al., 2009). This suggests that big firms having more growth opportunities along with higher investment in current assets receive more trade credit from their suppliers (García-Teruel and MartínezSolano, 2010). Alternatively, Niskanen and Niskanen (2006) found that trade credit is less likely to be used or demanded by large and old firms or firms with strong internal financing.

Trade credit is the spontaneous mode of financing that 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 based on 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).

2.3 Trade Credit Demand and Bank Loans:

Trade credit is a major source of short term financing for firms and plays a fundamental role in building up financing policies. There are several views about trade credit which explain the desire behind trade credit usage and one of them is the financial aspect which proposes that trade credit has some advantages over bank borrowing. For instance, information advantage about borrower's turnover and repaying capacity and minimal loss in case of default by repossessing the goods sold (Psillaki & Eleftheriou, 2015)

The past literature provides a blend of evidence about complementary and substitution effect of bank borrowing and trade credit. Biais and Gollier (1997) theorized that trade credit extension discloses positive signals to the banks which may increase the chances of favorable lending to the firms. Giannetti et al., (2011) support the argument and found that trade credit usage facilitates those firms having shorter relationships with their banks, and borrow from banks with relaxed terms, low fee and often obtain better deals. This finding suggests that bank borrowing and trade credit complement each other instead of substituting each other. Atanasova (2012) also examined the complementary relationship between trade credit and bank borrowing using panel data of UK firms. After controlling the endogeneity and unobserved heterogeneity of firms, it was found that small and young firms use excess trade-credit along with higher bank borrowing. The finding of his study validates the acceptance of the signaling hypothesis that more opaque firms get more trade credit and conveys positive signals about their creditworthiness and good reputation to fabdulanciers. Gama et al. (2010) investigated the Portuguese and Spanish SMEs and found that trade credit does play an informational role in developing a

good reputation for young and small firms. They also state that complementary and substitution is not mutually exclusive for young and small firms. From the sample of public firms of Brazil, Saito, and Bandeira (2010) obtained a similar conclusion that banks do facilitate loans to those firms having a sound reputation signaled by trade credit. Andrieu et al., (2018) confirmed the complementary relationship between trade credit and bank borrowing. They suggested that the provision of each mode of finance can be viewed as a signal which lenders analyze while granting finance (Agostino & Trivieri, 2014; Giannetti et al., 2011; Psillaki & Eleftheriou, 2015).

On the other hand, Meltzer (1960) proposed the trade credit and bank credit substitution hypothesis. He found that during the mid-1950s when money tightened in the US, banks were not the only source of financing for the small firms. He supported the idea that highly liquid firms tend to have more capacity to offer trade credit during tightened monetary conditions to financially constrained firms having no access to bank financings. This finding initiated the concept of trade credit as a substitute to bank borrowing. Blasio (2005) also favors the substitution hypothesis in the context of Italian firms and shows that financially constrained firms having difficulties in accessing bank credit usually go for trade credit (Gama et al., 2010; Huang et al., 2011). Nilsen (2002) states that most businesses prefer bank credit over trade credit because of the high costs associated with the trade credit. They only use trade credit when bank loans are scarce or monetary policy is tightened and loans are available at a higher rate. He also linked the choice of trade credit with monetary policy. Alphonse et al. (2003) stated that use of trade credit is decreased when bank credit is easily available to the firms, and financially

constrained firms prefer trade credit when access to bank credit is difficult. Yang and Birge (2013) also showed that these two sources of financing can be used simultaneously. A recent study by Tang and Moro (2020) found that bank credit and payables substitute each other. They uncovered a strong substitution effect among weak firms, possibly linked to the fact that weak firms struggle to access additional bank finance and thus are forced to rely on suppliers to support their growth. The substitution effect between payables and bank credit is robust to different cash conversion cycles and to the firm's liquidity. Inspired by the mixed evidence found for substitution and complementary effect between trade credit and bank loans, the following hypothesis is derived.

H_5: Trade credit demand is a substitute or complement to short term bank loans.

Considering the inventory management model presented by Bougheas et al. (2009), firms tend to delay the payments of goods of raw material purchased and make them clear on a monthly or quarterly basis. This benefits those firms having high inventory turnover by bridging the period between payment and purchase (Huyghebaert, 2006). Ahmed, et al, (2015) found that firms are more interested to acquire goods on credit and sale them on cash to avoid liquidity crisis as liquidity crisis may lead the firms towards financial distress and ultimately to bankruptcy (Mubashar et al., 2012). According to Ojenike and Olowoniyi (2014), firms which frequently need to replace their raw materials often demand more trade credit from suppliers. They explained that firms which frequently replace their inventories will naturally face high transaction cost of paying bills and trade credit, therefore, allow for some transaction cost savings.

Financially stressed firms always find difficulties in acquiring debt from capital markets to finance having higher debt obligations. As these firms have tight financial conditions leading to higher bankruptcy risk, these firms often get expensive external finance or often get their loans rejected. In such circumstances, the only option left with such financial distress firms is trade credit financing. These firms then rely heavily on trade credit as an alternative source of finance even though it is an expensive source of financing (Molina & Preve, 2012). On the other hand, firms having a sound financial position and more capacity of cash generation usually choose less borrowing from suppliers (Garcia-Teruel & Martinez-Solano, 2010; Niskanen & Niskanen, 2006). Following pecking order theory, it is also possible that firms having sound profitability pursue growth opportunities and invest more in fixed assets thus firms may rely on short term financing. Profitable and large firms which are considered as more creditworthy firms often get more credit from suppliers (Peterson & Rajan, 1997). As these firms are supposed to have fewer chances of default so suppliers safely extend credit to large firms (Bevan & Danbolt, 2004), therefore it is also possible that large firms having sound creditworthiness and smooth access to capital markets may get credit easily on relaxed terms.

By investigating trade credit usage among SMEs and large companies following the macroeconomic shock of the financial crisis of 2007/08, Abdulla et al., (2017) identified a firm size effect, which is genuine in the sense that it cannot be entirely explained by financial constraints, external finance dependence or creditworthiness. They found that SMEs, in contrast to large firms, do not display evidence for the inter-firm

liquidity redistribution hypothesis. Especially large vulnerable firms do cut down trade credit provision to the detriment of small vulnerable firms. Secondly, they document a general substitution effect between bank and trade credit and show that it has strengthened during the crisis among large firms, but not among SMEs. Thirdly, they provide evidence that the shift in trade credit financing had adverse and real effects on investment behavior of SMEs.

Trade credit is the short term mode of financing that is demanded and granted by firms regularly (Burkart & Ellingsen, 2004). This frequent demand and supply of trade suggest that firms' previous relationship history affects the future exchange of trade credit. Firms match the maturities of their payables as suggested by matching theory according to the timings of their receivables (Diamond, 1991; Bastos, 2010; Yang, 2011; Kwenda & Holden, 2014). This argument is also supported by Trade credit relationship theory (Bastos, 2010) which suggests that firms do maintain long term credit relationships based on past experiences with suppliers and customers and they may change their credit policy with customers if necessary depending on their history (Blasio, 2005).

2.4 Trade Credit and Firm Performance

Formulation of collection practices in the manufacturing sector has been a challenge in credit management. Moreover, enforcement of guarantee policies provide chances for credit recovery in case of credit defaults and staff incentives are also effective in improving recovery of delinquent credit. In addition, a stringent policy is more effective in debt recovery than a lenient policy and in this perspective; regular reviews have been

done on collection practices to improve state of credit management. And finally the available collection practices have been helpful in the effective credit management (Kargi, 2011; Cheptum, 2019)

Firms having a strong market position along with competitive market supply usually delay the payments by dictating their credit terms to their advantage. They also insist to have extended period for payments regardless of considering the supplier's policies and without having the threat about the loss of supply. Moreover, such buyers also demand after-sale services with high standards of delivery (Wilson, 2008). The discount policy affects the capital structure of firms in a way that the more extended the payment period will be, the greater will be the need for investment in the recovery of accounts receivable. If the firms are not capable of sufficient internal cash generation for financing their sale growth, then firms need to search for additional sources of financing either by demanding more trade credit from their suppliers or through the conventional bank loans (Carvalho & Schiozer, 2015).

On the other hand, from the seller's perspective, late payments may occur due to several reasons. First, weak business administration, lack of market power, poor credit management practices along with unclear credit policies increase the risk of late payments (Atrill, 2005). Second, product quality and customer service also play an important role in retaining good customers who pay on time. Third, in the phase of economic recession, late payments may turn into bad debts so to avoid the excessive amount of risk, suppliers often extend the credit terms to alleviate the cash flow problems being faced by both parties as firms find this mode of financing and extending the

payments cheaper, than to renegotiate bank loans (Garcia-Teruel & Martinez-Solano, 2010).

Keeping in view the possible reasons for late-payments and bad debts, the consequences of late payments are also examined by Paul et al., (2018) in the context of Malaysian manufacturing firms. They found a significant negative association between late payments and profitability which suggests that early payments help the firm in generating more profits and vice versa. Similar results are found by Wadud and Chakma (2018), who analyzed working capital using proxy of days' sales outstanding and profitability in the context of Bangladesh. The negative association suggests that the efficient collection of receivables leads the firm towards higher profits as quick payments are the indicators of standard product quality (Ng et al., 2017). These findings lead us to our next hypothesis:

H6: Late payments from debtors have a significant impact on the profitability of the firms.

Financial constraints for Small firms also have implications for the cash flow management. For instance, if small firms pay little attention to working capital management or spend little time on cash flow monitoring, there are great chances of experiencing cash flow-shocks. In such situation, delaying trade credit payment seems to be the most effective and convenient solution to overcome cash flow shortages. On the other hand, if small firms are fire fighting, a reverse causality may exist and firms which experience cash flow problems may be more actively managing working capital (Wilson et al., 1996).

Furthermore, from the size point of view, performance of firms may also vary with the investment capacities of firms as large firms have more opportunities and affordability to grab risky and profitable ventures as they also enjoy economies of scale in production whereas small firms are always reluctant to explore new ventures as their risk-bearing capacity is low (Dary & James Jr, 2019). Moreover, big businesses have easy access to various financing options so these companies use maximum resources to generate and maximize business profits whereas small firms having small asset bases are unable to do such aggressive financing and investments. Big business and highly liquid firms are considered as the most risk absorbing firms that can respond to unexpected changes in the financial environment. The high levels of liquid assets reflect that firms are in a better and improved position to grab more profitable opportunities without any need to access the capital market for funds hence lead to high performance (Goddard et al., 2005; Kestens et al., 2012). High liquidity also prevents firms from various exposures of not being able to meet short term obligations. But, holding excess liquid assets also constrains the ability of firms from investments.

Along with the size and liquidity of firms, the use of debt also affects the performance of the firms in both ways. For instance, it may be difficult for highly levered firms to access more capital to approach profitable ventures or the higher cost of debt due to high riskiness which is another challenge as use of excess debt indicates the stress level of firms (Martínez-Sola et al., 2014; Tang, 2014) so, the inverse relationship is expected between debt and performance of firms. On the other hand, Tsuruta, (2015) found that with the excess usage of debt, monitoring of lenders can also help in

improving the performance of the firms and this relationship is also proved in Japan where high leveraged firms outperformed low leveraged firms.

The performance of the firms is also dependent on the revenue growth that refers to the increase or decrease in volume of sales in terms of percentage every year (Akinlo & Olufisayo, 2011). Lagged profit margin, or the previous year performance of the firm is also included as the past performance of the firms which may impact future decisions. Similarly, as discussed by Levy (1986), it also ensures the persistence of profits by enabling partial adjustment to shocks.

2.5 Trade Credit and Stock Return Predictability

Since the 1960s, researchers are working on various methodologies to construct a model that can be considered as an ultimate approach for future stock prediction but due to different dynamics of every market, they remained unsuccessful. As financial shocks can certainly be absorbed by developed market without any major disruptions but developing markets can easily be disturbed even with a minor market change. Considering the fact, it has been observed that no single model can predict the stock market returns of different markets and if the same model is applied to different datasets, findings may contradict. Therefore, asset pricing models differ from market to market for stock return prediction (Urooj, 2017). In 1964, Sharpe presented the first beta based pricing model "Capital Asset Pricing Model" which was later on tested in different contexts. For instance, Lau et al., (1974) tested and confirmed the applicability of CAPM in the context of Tokyo. They also found that investors are compensated for the systematic risk. As CAPM was a

single-factor model, it could not succeed to predict the future returns of various markets. To address the problem, Roll and Ross (1980) presented the APT model with the introduction of new variables and various factors and those factors found to have macroeconomic significance to predict future stock reruns. In 1992, Fama and French proposed the "three-factor model" which included market factor, size factor, and book to market ratio for prediction of cross-sectional returns.

In 1992, Fama and French developed a model for asset pricing with the inclusion of two more factors with market beta i.e. size premium and value premium. This model was developed to efficiently capture the cross-sectional variations in stock returns as compared to CAPM in the context of the US market. They found that the presence of size and value premiums was the compensation for bearing risk by investors. Shafana et al., (2013) also analyzed the 3-factor model using the same factors in the context of Sri-Lanka and found a negative impact of value premium and an insignificant impact of size premium on stock returns.

With the development of asset pricing models, further modifications also took place regarding data structure to avoid statistical errors. Black et al., (1972) constructed monthly portfolio of stock returns with single factor-beta estimation and found it consistent whereas Fama & Macbeth, (1973) modified the model by introducing two-pass regression and performed cross-sectional regressions on month-to-month basis and then averages were calculated for time-series transposed data to find the estimation of risk premiums. Following the work of Fama Macbeth, Pettengill et al., (1995) used CAPM and encountered the issue of negative observations while assessing the portfolio and

market risk by sorting the data sets with positive and negative values and formed portfolios using bull and bear phenomenon and after that estimated the portfolios for testing periods. Pattengill's approach of conditional CAPM was later on followed by Fletcher (2000) in the context of developed market, by Abdullah et al., (2011) for emerging markets, Karacabey and Karatepe (2004) for Istanbul and by Azher (2014) for Pakistan stock exchange and all found consistent results of beta and returns by splitting sample into portfolios.

2.5.1 Informational role of Trade Credit and Future Stock Returns

Literature on the signaling model and information content suggests that trade credit is being used by managers to send a signal about their private information related to their performance of business and investment projects' quality (Aktas et al., 2012).

On the other hand, Goto et al., (2015) suggest that the supplier's private information about the buyer's future growth is also incorporated with trade credit. The signaling model was first introduced by Biais and Gollier (1997) where suppliers have monitoring advantage over banks to screen their borrowers and thus alleviate credit rationing. Jain, (2001) also examined the informational role of trade credit and found that suppliers gain information related to buyers' revenues and performance in the routine of the business without incurring any additional cost which banks have to pay. These results are also supported by Giannetti et al., (2011) who explored the informational role in the context of US non-financial firms and found that banks tend to finance those firms having access to trade credit, using the supplier's information about buyer's creditworthiness and

these firms have to pay low fees on their credit lines. The study concluded that trade credit extension benefits potentially less-informed lenders. Recently, Agostino and Trivieri, (2014) explored the signaling aspect of trade credit in the context of small and new firms of Italy and confirmed the hypothesis that for new firms for which record is not yet established, trade credit extension is also considered as a positive signal about the severe opaqueness of the firms. Goto et al., (2015) examined the informational content in predicting the sales growth and future stock returns by using the trade-credit ratio. They found that trade credit does incorporate an information advantage that supplier has about its customers' future sales growth. This information advantage is further analyzed and extended to the stock market to test their ability to generating stock return predictability. They also found that the supply of trade credit discloses the information held with a supplier that is gradually diffused across the investors market.

Following the influential work of Goto et al., (2015), after controlling both macro and micro factors, they found that firms that depend more on trade credit as compared to debt financing have higher subsequent stock returns. So, this analysis also adds to the literature of suppliers' information advantage that generates signals about the future performance of the buyer's business which results in lowering the reputational risk of the buyer hence signals the uplift of future returns of the firms which is translated in the stock markets. This leads to the following hypothesis.

H_7: Informational role of trade credit predicts future stock returns of the borrowing firms.

Empirical literature has widely used market capitalization as a proxy of measuring size. High-cap firms are considered as “Big” whereas low-cap firms are referred to as “Small”. The size was initially tested by Banz (1981) with stock returns and found that high returns are earned by small capitalized firms as incomplete information is available for small firms so the uncertainty results in size effect. Similarly, Fama and French (1993, 1996) also tested the size effect for predicting future stock returns using Fama Macbeth's (1973) methodology in the context of different countries and found it as a strong predictor of future stock returns. On the contrary, Merton (1987) argues that big firms having a high investment base tend to yield higher expected returns. Market capitalization is used as a proxy of measuring the size which is also criticized by Coleman (1997) who argued that it is a misconception of investors who believe that firms with high market capitalization will earn high returns in the context of Pakistan. Moreover, different results were obtained by Mirza (2008) while evaluating the “Fama & French three-factor model” found positive results with size premium for small firms generating higher returns. On the other hand, Khan et al., (2012) examined the size premium in the context of Pakistan using market capitalization with stock returns and found that large firms outperformed small firms.

Another firm-specific factor that may predict future stock returns is the value of the stock which is measured as the deviation between the book value of stock and market value of stock and is considered as an important factor in predicting stock returns. Firms bearing low book to market ratios are considered as “growing stocks” whereas firms having high book to market ratios are termed as “value stocks”. Rosenberg et al., (1985)

found a positive impact of value premium on stock returns and also found that stocks having high book to market ratio outperformed low book to market stocks.

In Pakistan, the 3-factor model is also analyzed and the results obtained suggest that these factors are priced by the Pakistani equity markets (Hasan, 2010; Chughtai, 2016). Previous researches have also documented the role of accruals in predicting cross-sectional returns. Sloan (1996) found a negative relationship between stock returns and accruals. This is justified on the basis of the fact that high accruals are the indication of effective earnings management whereas investors wrongly perceive this signal and expect more increase in future profitability. Kothari et al. (2006) found similar results that managers overstate their earnings which results in overpriced equity and therefore, result in negative future stock returns.

Urooj (2017) also tested CAPM in the context of Pakistan and it was discovered that the role of stock's beta is insignificant while predicting future returns. These results differ from the theory which states that stock returns should be positively predicted by the market premium while intercept should be zero, but the results contradict with the theory as market premium was insignificant whereas the intercept had statistical significance in determining the future returns.

2.6 Hypotheses Development

The following hypotheses have been proposed in the light of the previous literature.

H_1: Under helping hand motive; firms which are profitable and have greater access to external sources of financing, extend more trade credit.

H_2: Under the price discrimination motive of Trade Credit; firms' gross margin is significantly related to trade credit extension.

H_3: Under the commercial motive of Trade Credit; firms' sales growth is significantly related to trade credit extension

H_4: Trade credit is less offered by firms of highly concentrated markets

For the above-stated hypotheses, the following theoretical framework is formulated:

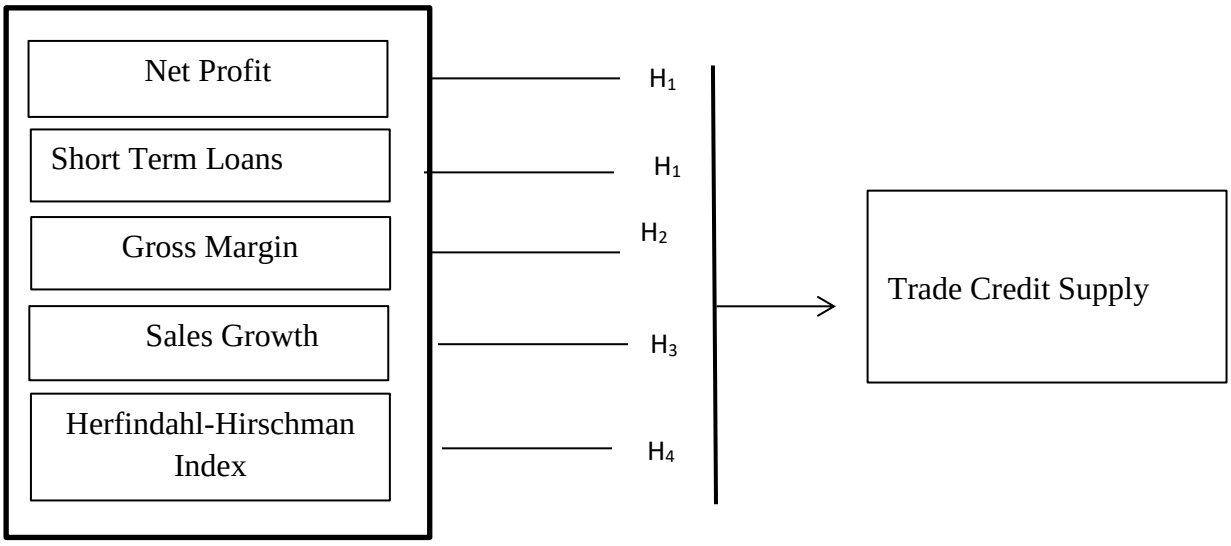

Figure 1: Trade Credit Supply Model

H_5: Trade credit demand is a substitute or complement to short term bank loans.

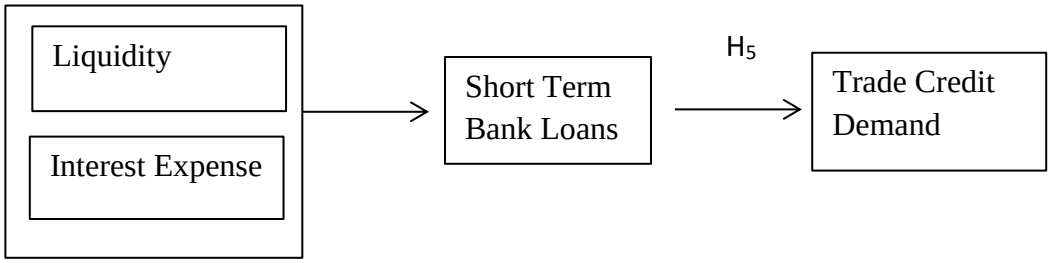

Figure 2: Substitution Effect of Bank Loans and Trade Credit Model

H_6: Late payments from debtors have a significant impact on the profitability of firms.

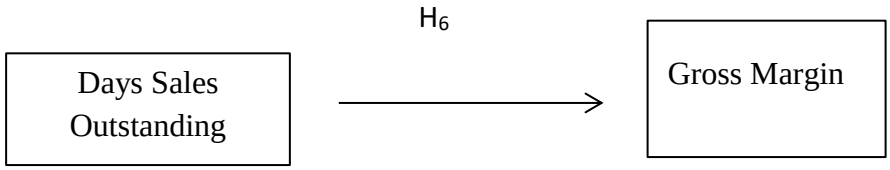

Figure 3: Late Payments Model

H_7: Trade credit predicts future stock returns of the borrowing firms.

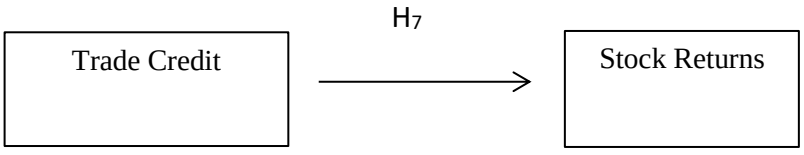

Figure 4: Stock Return Predictability Model

Chapter III

3. Research Methodology

This chapter covers the following sections:

3. 1: Data Description

3. 2: Methodology

3. 3: Models Specification

3. 4: Measurement of Variables

3. 5: Definition of Variables

The present study aimed to analyze the motives behind trade credit extension along with the comparison of different modes of short term financing. Further, the consequences of trade credit in terms of late payments were also addressed in the context of the performance of firms. Lastly, the ability of the macro-level impact of trade credit was also examined in predicting the stock returns. To meet the objectives, a variety of samples, research techniques, and variables have been used which are discussed in this chapter. Below are the research designs, research population, and research sample along with the collection procedure of data for dynamic analysis of trade credit. The variables which are used in this study are also explained along with proxies that are used to measure the variables.

3.1 Data Description

3.1.1 Research Population

The research population of this study includes all manufacturing firms listed at the Pakistan Stock Exchange from 2005 to 2017. Davis et al. (2000) state that the sample period and sample size significantly affects the findings of the study therefore, the study uses an appropriate data set to mitigate the problem. All listed manufacturing firms which remain listed for 13 years are included.

3.1.2 Research Sample

For sample selection, availability of complete data was the prime criteria because data of trade credit demand variable i.e. accounts payable are not commonly reported by firms.

Secondly, financially distressed firms having negative equity values were excluded as they may disturb the analysis. Further, to capture the various aspects of trade credit, the nature of analysis for each model varies, therefore, the sample size also differ from each other. In this study, the required data set is panel data i.e. time series and cross-sectional data and for collection of panel data, the company's annual reports and Financial Statement Analysis are used. The important point that is kept under consideration is that data for all years 2005-2017 is available to make sure that continuity in data is achieved and results are unbiased. The sample details of each model are mentioned below:

1. For analysis of trade credit extension motives, data set comprises of a balanced panel of 150 manufacturing firms after omitting firms having outliers for the period 2005 to 2016.

2. For testing the substitution hypothesis, after omitting firms having outliers, our panel data comprise of a balanced panel of 136 firms based on data availability for the period 2005 to 2016.
3. For the late payments model, after omitting firms having outliers or missing data, the balanced panel data consist of a balanced panel of 126 firms covering the period from 2007 to 2017.
4. To test stock returns predictability of trade credit in the context of Pakistan, the sample consists of accounting data and stock returns data of manufacturing firms of Pakistan because of their excessive usage of trade credit. The criteria for sample selection are as follows: First, initial screening was done based on the availability of complete accounting and stock price data of manufacturing firms

listed at Pakistan stock exchange. Second, financially distressed firms having negative equity values and negative book to market ratios were excluded as they may disturb the analysis. Third, extreme values were also omitted and finally, our balanced panel data includes 90 firms for the period 2007 to 2017. The data was extracted from annual reports of the companies, published reports of State Bank of Pakistan and stock prices were downloaded from the PSX official website. All factors estimation and portfolio development occurred at the end of June each year.

3.2 Models Specification

For testing various hypotheses about trade credit theories, substitution effect, late payments, and stock returns predictability, the following models are used.

3.2.1 Trade Credit Extension Motives

To capture the effect of various motives on trade credit extension, the baseline model (1) along with the dynamic panel model (1a) by adding a lagged TCS term for estimating trade credit supply motives are expressed as below:

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

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

Model 1 is developed to empirically test the motives of trade credit extension where TCS is the proxy of trade credit supply measured by accounts receivable to total assets., PROF is profitability and STD is short term debt to test all sources of financing for measuring helping hand motive. For H_2, Gross Margin (GM) is used as a proxy to capture the effect of price discrimination motive. SG is sales growth for measuring the commercial motive. HHI is the Herfindahl-Hirschman index for measuring market power theory. Control variables are: firm size (SIZE), Liquidity Ratio (LIQ) and lagged trade credit supply ($TCS_{i, t-1}$). μ represents the firm-specific effect and the fixed differences between cross-sections that could not be observed, but are likely to be correlated with explanatory variables. υ is the remainder disturbance term.

3.2.2 Trade Credit Substitution Effect

To capture the substitution effect of trade credit and banks loans, the standard model (2) along with the dynamic panel model (2a) by adding a lagged TCS term and instrumental variables for estimating substitution hypothesis are expressed as below:

Model 2: $TCD_{it} = \beta_0 + \beta_1 STD_{i,t} + \beta_2 INV_{i,t} + \beta_3 LEV_{i,t} + \beta_4 PROF_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 TCD_{i,t-1} + \mu_{i,t} + \nu_{i,t}$

Model 2(a): $STD_{it} = \beta_0 + \beta_1 IE_{i,t} + \beta_2 LIQ_{i,t} + \beta_3 INV_{i,t} + \beta_4 LEV_{i,t} + \beta_5 PROF_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 TCD_{i,t-1} + \mu_{i,t} + \nu_{i,t}$

Model 2 is estimating the substitution effect of trade credit and banks loans where dependent variable is Trade Credit Demand (TCD), independent variable STD is Short

Term Bank Loan, control variables are Inventory Turnover (INV), leverage (LEV), profitability (PROF) and lagged TCD to capture the effect of previously demanded trade-credit, keeping in view the credit relationship theory (Bastos, 2010).

However, it must be noticed that the explanatory variable, bank credit, is not exogenously given, yet might be influenced by other factors. Other than control variables included in Model (2), there might be some other omitted variables affecting the access to trade credit and bank credit simultaneously, leading to endogeneity bias. To test the endogeneity issue, interest expense (IE) and liquidity (LIQ) can be used as instrumental variables, as they are closely related to the access of short term bank credit but are not directly related to trade credit demand. After testing endogeneity using *Wu-Hausman test,* and obtaining the variables as endogenous, we moved to two-stage least square.

3.2.3 Late Payments and Firm Performance

To capture the impact of trade credit extension consequences on performance of firms, the standard model (3) along with the dynamic panel model (3a) by adding a lagged GM term are expressed as follow:

Model 3: $$GM_{i,t} = \beta_o + \beta_1 DSO_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LIQ_{i,t} + \beta_4 DR_{i,t} + \beta_5 RG_{i,t} + \varepsilon_{i,t}$$

Model 3(a): $$GM_{i,t} = \beta_o + \beta_1 DSO_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LIQ_{i,t} + \beta_4 DR_{i,t} + \beta_5 RG_{i,t} +$$

$$+\beta_6 GM_{i,t-1} + \mu_{i,t} + \nu_{i,t}$$

The model estimates the effects of delayed payments by creditors on the performance of firms where the dependent variable is Gross Margin (GM) and

independent variables are Day's sales outstanding (DSO), representing number of days taken by a firm for collection of sale process. Liquidity (LIQ) is used to test whether firms are grabbing profitable opportunities or they are maintaining the liquidity cushion for uncertain shocks. Leverage (DR) is measured using the proxy of the debt ratio to test the riskiness of firms. Revenue Growth (RG) is used as a proxy to test the impact of increased or decreased sales.

3.2.4Trade Credit and Stock Return Predictability

The following multifactor models are proposed to test stock returns predictability in the context of the Pakistani equity market:

3.2.4.1Fama & French Three-Factor Model:

Following the Fama & French's three-factor model, Model 4(a) given below captures the impact of Market factor, Size factor and Value factor on Stock returns.

Model 4(a): $R_{pt} - R_{ft} = \alpha_t + \beta_1(R_{mt} - R_{ft}) + \beta_2(\mathrm{SMB_t}) + \beta_3(\mathrm{HML_t}) + \mu_t$

Where

R_{pt} = Expected stock returns on portfolio "p" at time *t*

R_{ft}= Risk free rate of return at time *t*

R_{mt} = Market returns at time *t*

SMB= Returns of small sized firms – returns of big sized firms at time *t*

HML=Returns of high Book to market firms-returns of low Book to market firms at time *t*

μ_t = error term

3.2.4.2 Two-Pass Regression for Fama and French Three-Factor Model:

Following the Fama Macbeth model using Fama & French's three-factor model, Model 4(b) given below, captures the impact of Market factor, Size factor and Value factor on Stock returns.

Model 4(b): $(R_{pt} - RFR) = \alpha_t + \gamma_{MKT,t}\hat{\beta}_{MKT} + \gamma_{SMB,t}\hat{\beta}_{SMB} + \gamma_{HML,t}\hat{\beta}_{HML} + \varepsilon_{i,t}$

Where

R_{pt}-RFR = Stock returns in excess of Risk free rate of return on portfolio "p" at time "t"

$\hat{\beta}_{MKT}$= estimated factor loadings of market return in excess of risk free rate of return

$\hat{\beta}_{SMB}$ = Estimated factor loadings of small minus big

$\hat{\beta}_{HML}$= Estimated factor loadings of High minus Low.

μ_t = error term

3.2.4.3 Extended Four-Factor Model:

Following the Fama & French's four-factor model, Model 4(c) given below, captures the impact of Market factor, Size factor, Value factor and Performance factor on Stock returns.

Model 4(c): $R_{pt} - R_{ft} = \alpha_t + \beta_1(R_{mt} - R_{ft}) + \beta_2(SMB_t) + \beta_3(HML_t) + \beta_4(ACC_t) + \mu_t$

Where

R_{pt} = Expected stock returns on portfolio "p" at time *t*

R_{ft}= Risk free rate of return at time *t*

R_{mt} = Market returns at time *t*

SMB= Returns of small sized firms – returns of big sized firms at time *t*

HML=Returns of high Book to market firms – returns of low Book to market firms at time *t*

ACC= Returns of low accrual firms– Returns of high accrual firms at time *t*

μ_t = error term

3.2.4.4 Two-Pass Regression for Extended Four-Factor Model:

Following the Fama Macbeth model using Fama & French's four-factor model, Model 4(d) given below, captures the impact of Market factor, Size factor, Value factor and Performance on Stock returns.

Model 4 (d):$(R_{pt} - RFR) = \alpha_t + \gamma_{MKT,t}\hat{\beta}_{MKT} + \gamma_{SMB,t}\hat{\beta}_{SMB} + \gamma_{HML,t}\hat{\beta}_{HML} + \gamma_{ACC,t}\hat{\beta}_{ACC} + \varepsilon_{i,t}$

Where

R_{pt}-RFR = Stock returns in excess of Risk free rate of return on portfolio "p" at time "t"

$\hat{\beta}_{MKT}$= estimated factor loadings of market return in excess of risk free rate of return

$\hat{\beta}_{SMB}$ = Estimated factor loadings of small minus big

$\hat{\beta}_{HML}$= Estimated factor loadings of High minus Low.

$\hat{\beta}_{ACC}$ = Estimated factor loadings of low minus high

μ_t = error term

3.2.4.5 Extended Five-Factor Model:

Following the Fama & French's three-factor model, Model 4(e) given below, captures the impact of Market factor, Size factor, Value factor, Performance factor and Information factor on Stock returns.

Model 4 (e): $R_{pt} - R_{ft} = \alpha_t + \beta_1(R_{mt} - R_{ft}) + \beta_2(SMB_t) + \beta_3(HML_t) + \beta_4(ACC_t) + \beta_5(NTC_t) + \mu_t$

Where

R_{pt} = Expected stock returns on portfolio "p" at time *t*

R_{ft}= Risk free rate of return at time *t*

R_{mt} = Market returns at time *t*

SMB= Returns of small sized firms – returns of big sized firms at time *t*

HML=Returns of high Book to market firms – returns of low Book to market firms at time *t*

ACC= Returns of low accrual firms– Returns of high accrual firms at time *t*

NTCR= Returns of low NTC – Returns of high NTC firms at time *t*

μ_t = error term

3.2.4.6 Two-Pass Regression for Five-Factor Models:

Following the Fama Macbeth model using Fama & French's three-factor model, Model 4(b) given below, captures the impact of Market factor, Size factor, Value factor, Performance factor and Information factor on Stock returns.

Model 4(f): $(R_{pt} - RFR) = \alpha_t + \gamma_{MKT,t}\hat{\beta}_{MKT} + \gamma_{SMB,t}\hat{\beta}_{SMB} + \gamma_{HML,t}\hat{\beta}_{HML} + \gamma_{ACC,t}\hat{\beta}_{ACC} + \gamma_{NTCR,t}\hat{\beta}_{NTCR} + \varepsilon_{i,t}$

Where

R_{pt}-RFR = Stock returns in excess of Risk free rate of return on portfolio "p" at time "t"

$\hat{\beta}_{MKT}$= estimated factor loadings of market return in excess of risk free rate of return

$\hat{\beta}_{SMB}$ = Estimated factor loadings of small minus big

$\hat{\beta}_{HML}$= Estimated factor loadings of High minus Low.

$\hat{\beta}_{ACC}$ = Estimated factor loadings of low minus high

$\hat{\beta}_{NTCR}$= Estimated factor loadings of low NTCR –high NTCR

μ_t = error term

3.3 Measurement of Variables:

Below are the measurements of the variables used in this study.

Table 3.1: Measurement of Variables

Variables	Measurement	References
1. Trade Credit Supply	Ratio of Accounts Receivables to Total Assets	Lau & Schaede, (2019)
2. Profit	Net Profit/Total Assets	Ying et al., (2014)
3. Short Term Debt	Short Term Loans to Total Assets	Wadud & Chakma (2018)
4. Gross Margin (GM)	Gross Profit to Sales	Wadud & Chakma (2018)
5. Sales Growth	Percentage Change in Sales	Garcia-Teruel & Martinez-Solano, (2007)
6. The Herfindahl-Hirschman Index (HHI)	Sum of squared market shares of firms in terms of sales	Rhoades, A. (1993).

7. Size	Ln(Assets)	Ying et al., (2014)
8. Liquidity	Current Assets/Current Liabilities	Keown et al., (2004)
9. Trade Credit Demand	Accounts Payable to Total Assets	Hasan & Habib, (2018)
10. Inventory Turnover	Cost of Goods Sold/Average Inventory	Huang et al., (2011)
11. Leverage	Total Debt/Total Assets	Ying et al., (2014)
12. Interest Expense	Interest Expense/ Total Borrowing From Bank	Ying et al., (2014)
13. DSO (Days Sales Outstanding)	Accounts Receivable / (Annual Sales / 365 days)	Deloof, (2003)
14. Portfolio Returns (R_p)	Excess Stock Returns of portfolio at time *t*	
15. Market (MKT)	Return of KSE Index at time *t*	
16. Size (SMB)	Returns of small sized firms – returns of big sized firms at time *t*	
17. Book to Market Ratio (HML)	Returns of high Book to market firms – returns of low Book to market firms at time *t*	

18. Accruals (ACC)	Returns of low accrual firms– Returns of high accrual firms at time *t*
19. Neutral Trade Credit Ratio (NTCR)	Returns of low NTC – Returns of high NTC firms at time *t*

3.4 Definition of Variables:

The following are the definitions of all variables that were used to test the hypotheses.

3.4.1 Trade Credit Supply

Trade credit is the short term mode of financing which is frequently granted by firms (Burkart & Ellingsen, 2004). Trade credit supply is about supplying goods and services on a deferred payment basis, rather than requiring cash immediately. These payments that are due on part of buyers are recorded in the supplier's books of accounts as accounts receivable or trade debtors.

3.4.2 Profitability

To evaluate financial performance, net profit after tax figure is considered as the major reflective of the profitability of the company. This ratio represents the effectiveness in terms of the utilization of the corporate assets for generating profits. Firms with a high profitability ratio show that management is effectively utilizing the assets for profit generation (Dorsey & Boland, 2009).

3.4.3 Short Term Debt

The short-term bank loans are computed by incorporating the measure of total short-term bank loans to total assets. In this study, this proxy is used to measure the access of firms to short term financing (Ahmed, 2015). Short term debts here referred to the part of the debt which is due in less than a year.

3.4.4 Gross Margin

For measuring price discrimination motive, the gross profit margin ratio is used as a proxy, i.e. gross profit over sales. Firms having high gross margins can better enjoy their market share by supplying more trade credit. Such firms usually forgo some profit margins for covering the implied cost of trade credit in expectation for higher sales but along with higher credit risk (Petersen & Rajan, 1997; Soufani & Poutziouris, 2002).

3.4.5 Sales Growth

Wilson (2008) indicates that firms that follow a growth strategy tend to offer more trade credit to grow their sales. This growth strategy is consistent with the marketing perspective of the use of credit. Petersen and Rajan (1997) also find firms having positive sales growth offer more credit transactions to their regular customers for maintaining long-term business relationships.

3.4.6 The Herfindahl-Hirschman Index (HHI)

The Herfindahl-Hirschman index is used to determine the market power allocation within each industry. The index serves as a measurement to compute the amount of competition among firms in the same industry (Rhoades, 1993).

3.4.7 Size

Firm size is used as a proxy to measure the creditworthiness of the firms. Petersen & Rajan (1997) argue that creditworthy customers, having higher credit quality, measured by size, should be offered more credit by their suppliers. Bevan & Danbolt, (2004), further claim that big firms are less likely to bear risk of default therefore, such firms are offered more trade credit.

3.4.8 Liquidity

Firms having a 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 obligations. This also indicates working capital solvency.

3.4.9 Trade Credit Demand

Demand-side of trade credit refers to the credit transactions that are offered by the suppliers and received by buyers. These transactions are usually recorded under the head of accounts payable in the books of accounts of trade credit users.

3.4.10 Inventory Turnover

Considering the inventory management model presented by Bougheas et al. (2009), firms use to delay the payments of goods of raw material purchased and make them clear on a monthly or quarterly basis. This motive benefits those firms having high inventory turnover by bridging the period between payment and purchase. This suggests that firms having high inventory turnover demand more trade credit (Huyghebaert, 2006). Ahmed, et al, (2016) found that firms are more interested to acquire goods on credit and sale them on cash to avoid a liquidity crises.

3.4.11 Leverage

Leverage measures the ability of the firm to which it depends on external financing. The leverage ratio is calculated using total debt obligations of the firm divided by average total assets. Leverage can be problematic for the company if it is not sufficiently earning and therefore unable to pay off its interest expense. On the other hand, if the firm is earning sufficiently more than its interest expense, then it reflects the financial stability of the firms. In both cases, it also increases the firm's financial risk and may stop financial flexibility (Brigham & Ehrhardt, 2002).

3.4.12 Interest Expense

Interest expense is expressed as a ratio of interest expense to the total borrowing from the bank. This ratio depicts the current financial burden of loans of firms and also signals the bank about future borrowing capacity.

3.4.13 Days Sales Outstanding

Days sales outstanding known as DSO, is a measure used to calculate the period that firms take for their collection of payments in terms of the average number of days and the higher value of DSO indicates that firms are taking a longer period of time for collecting their accounts receivable (Deloof, 2003; Garcia-Teruel & Martinez-Solano, 2007; Nasruddin, 2008).

3.4.14 Stock Returns:

Monthly Stock prices are downloaded on the last trading date of the month and monthly returns are calculated for each year (from July to June) by taking the natural log of current price divided by previous price following the continuous compounding assumption for portfolio analysis. For excess stock returns, annual T-Bills rate (Risk-free rate) data was obtained which were then divided by 1200 to get monthly rates.

$$\boldsymbol{R_{i,t} = ln\left(\frac{P_t}{P_{t-1}}\right)}$$

$R_{i,t}$ = Monthly continuously compounded return for security I at month t.

P_t = Closing share price of the stock at last trading day of month t

P_{t-1} = Closing share price of the stock at last trading day of month t-1

3.4.15 Market Returns (Market Factor):

Market factor is measured as an excess return of market portfolio which is market return minus risk-free rate. Basically, market portfolio contains the information of all assets and

liabilities available in the market (Chughtai, 2017). For diversification of unique and firm-specific risk, portfolios should comprise of maximum securities as securities are prone to the movements of systematic risk (Friend & Blume, 1970). Market returns are calculated using closing prices of the KSE-100 index.

$$R_{m,t} = ln\left(\frac{P_t}{P_{t-1}}\right)$$

$R_{m,t}$ = Monthly continuously compounded return for market index I at month t.

P_t = Closing index value of the KSE-100 at last trading day of month t

P_{t-1} = Closing share price of the KSE-100 at last trading day of month t-1

3.4.16 Market Capitalization (Size Factor):

Size of the firm is represented by the market capitalization. At a point of high market capitalization, the stocks of the firms are referred to as “big stocks” whereas in case of low market capitalization, the stocks of the firms are referred to as “small stocks”. Size namely was first tested by Banz (1981) in testing asset pricing model for NYSE by using common stocks for empirically testing the relationship between stock returns and market value of the stocks and established meaningful and fitting results. In this study, Market capitalization is a proxy used to measure the size of the firms based on the market price of shares and the total number of shares outstanding (Banz, 1981).

3.4.17 Book to Market (Value Factor):

Book-Market ratio is a proxy used to measure the forward-looking information about a firm's future performance. This ratio is calculated using accounting data and market data i.e. book value of equity to market value of equity (Rosenberg, 1985). This ratio also refers to the value of the firm and denoted by book-to-market ratio of a firm. Firms having high Book to Market ratios are referred as "value stocks" whereas firms with low Book to Market ratios are named as "growth stocks".

3.4.18 Accruals (Performance Factor):

Another variable for measuring the forward-looking information is Accruals as it is a better indicator of the performance of firms than the current period's receipt and payment. This variable is measured using the cash flow statement approach by subtracting cash flow from operating activities of the current period from net income of the current period and divided by lagged total assets (Collins & Hribar, 2002).

3.4.19 Trade Credit Ratio (Information Factor):

The trade credit ratio is measured by dividing accounts payables to total debt obligation. This ratio is considered as a raw trade-credit ratio (RTCR) which is used as a proxy to measure the suppliers' information advantage over a financial institution. This ratio can take values from zero to one where one means that the firm is solely relying on trade credit. This proxy is theory-driven as the lending activities of suppliers and financial institutions are accompanied by the information they have about borrowers, therefore, the

denominator of the ratio justifies the information advantage of suppliers relative to financial institutions. This measurement is consistent with Nissim and Penman (2003); Cuñat (2007). To observe firm-specific and unique variation of the trade credit ratio, RTCR is neutralized by regressing raw trade-credit ratio on factors affecting RTCR such as book to market ratio, market capitalization, and leverage to capture the common variations and then residuals are estimated. In the following empirical analysis, these residuals are used and termed as "NTCR" to mean the neutralized trade-credit ratio (Goto et al., 2015).

3.5 Methodology

For this study, panel data is given preference because it provides a multi-dimensional approach. It also provides time series as well as cross-sectional dimensions of data that make the analysis more strong and reliable. It also controls the possible unobservable heterogeneity that may arise due to the number of cross-sections. Moreover, it enables us to take out biases getting from the presence of individual effects (Hsiao 1985). Besides, the panel data approach also makes it conceivable to estimate dynamic responses with firm-level data. However, trade credit is analyzed from various aspects therefore, depending upon the nature of analysis and theoretical foundations, a variety of techniques have been used which are mentioned below.

3.5.1 Trade Credit Extension Motives Estimation

The testing of motives behind extending trade credit is analyzed using dynamic panel estimation. In our model, dynamic panel estimators enable us to verify if the current

period's (t) dependent variable is associated with the previous period (t-1). In other words, it enables us to test the persistence of trade credit supply conveniently. Dynamic panel regressions are by default prone to the presence of autocorrelation, due to the inclusion of the lagged dependent variable as an explanatory variable. This concern of autocorrelation arising from the addition of a lagged dependent variable among the explanatory variables and unobserved interaction spuriously affects the heterogeneity among the cross-sections. Therefore, the application of OLS, the fixed effect (FE) or even the random effects (or the Generalized Least Square estimator) may produce biased and inconsistent results. The model 1(a) mentioned in section 3.3 below is estimated using the system generalized method of moments (GMM) of Blundell and Bond (1998). The choice and suitability of this estimation technique is based on various conditions. These conditions are a larger number of cross-sections (large N), with a short time (small T), along with a linear functional relationship. Furthermore, the left-hand side variable has to be dynamic which in our case, trade credit is, while all other independent variables are not strictly exogenous (Roodman, 2009). In the meantime, the system-GMM approach is preferred over the difference-GMM of Arellano and Bond (1991) due to its distinction for including more instruments that generally improve proficiency. The system GMM designs the system of two equations: the original equations and the transformed ones. In the first instance, it runs the regression estimation levels by adding lagged levels and lagged differences as instruments.

The inclusion of lagged dependent variables as instruments in GMM estimations under the assumption of ''white noise'' disturbances are not consistent if the errors are

auto-correlated. Therefore, this approach assumes that there is no second-order serial correlation in the errors in the initial differences. Hence, to test the consistency of the estimations, we applied the test proposed by Arellano and Bond (1991) for ensuring the absence of second-order serial correlation. Similarly, the Sargan test of over-identifying restrictions is also employed to test the absence of correlation between the instruments and the error term.

3.5.2 Estimation for Substitution Hypothesis

Before estimating any model, assumptions of the ordinary least square method (OLS) were required to be tested for the specific structural equation because they may affect the estimation. In OLS, there is an assumption of independence of error terms values with predictor variables otherwise it may lead to the problem of endogeneity. To test the endogeneity that whether there is any correlation between the error term and independent variables as it may affect the parameters of interest in the context of the specific structural model, Wu-HAusman test is applied. (Maddala, 2001). So, for the estimation of substitution effect of bank loans and trade credit demand in the basic model, short term debt is proved to be endogenous and is likely to be correlated with the error term. Therefore, OLS estimation cannot be performed as the assumption is violated, two-stage least squares (2SLS) regression analysis helps us to solve this problem.

The basic assumption of two-stage least squares (2SLS) regression analysis is that there is a secondary predictor (an alternate variable) that is associated with the problematic or endogenous variable but not with the disturbance term. One of the two

stages of 2SLS refers to the creation of a new variable which substitutes the original endogenous variable. Later in the second stage, OLS regression is computed with newly generated variables. The reason for the first stage is to create a new variable which fulfills the OLS regression assumption.

In 2SLS regression analysis, the problematic variable is replaced with a new variable known as an instrument variable. Problematic causal variable is used as a dependent variable whereas instrumental variables are regressed along with other control variables by applying OLS estimations. For this purpose, instrumental variables were exogenous and also have an association with problematic variables but not with the dependent variable. This step is done by applying OLS regression using the problematic causal variable as the dependent and instrumental variables as the independent variables (Abeywardhana & Krishanthi, 2012). For the sake of estimating the substitution effect in the presence of endogeneity, two instrumental variables have been identified as liquidity and Interest expense.

3.5.3 Estimation for Late Payments and Firm Performance

The impact of late payments on the profitability of manufacturing firms is tested using dynamic panel estimation by incorporating the impact of previous profitability (Mcdonald, 1999). Dynamic panel regressions have a built-in problem of the existence of autocorrelation which is a result of adding the lagged dependent variable as an independent variable as estimations lost its consistency when used in static frameworks.

Considering this limitation, estimations are done by applying the general method of moment (GMM) on the equation in the first-difference. However, Blundell and Bond (1998) presume that when there exists a high correlation between current and past period values with small-time period, Arellano and Bond's GMM (1991) estimator is inefficient and the instruments used are generally fail. In these conditions, Blundell and Bond (1998) developed a system of GMM estimator by adding variables at levels and first differences. For the variables at levels in model 3, the instruments are the lagged variables in first differences. In the case of the variables in first differences in model 3a, the instruments are lagged variables at levels. In any case, the Arellano and Bond's GMM (1991) and Blundell and Bond's GMM system (1998) estimators needed to be viewed based on two conditions: (1) the validity of instruments (2) and the absence of second-order autocorrelation. To test the first condition of restrictions validity, the Sargan test is applied for Arellano and Bond's GMM (1991) estimator and the Hansen test is applied for System-GMM of Blundell and Bond (1998) estimator. In both these cases, the null hypothesis indicates the validity of the imposed restrictions and non-validity of restrictions is indicated by the alternative hypothesis. By accepting the null hypothesis (p-value > 0.05), the robustness of estimators is concluded. Next, for testing the presence of first- and second-order autocorrelation with null hypothesis stating zero autocorrelation and alternative hypothesis stating the presence of autocorrelation, Arellano and Bond test is applied. For the robustness of estimators, the null hypothesis was predicted to be accepted.

3.5.4 Estimation for Stock Return Predictability

Decision making in finance particularly in portfolio management, capital budgeting, and equity valuation requires return estimation on individual firm basis (Shahzad et al., 2014). To test multi-factor asset pricing models, macro-economic factors, as well as firm-specific characteristics, are used to predict cross-sectional returns considering the systematic risk. Fama and French's (1992) three-factor model is the appropriate methodology for predicting stock returns by considering both market and firm-specific characteristics after sorting stocks and formulating portfolios.

The literature suggests that portfolio formation leads to the elimination of unsystematic risk along with minimization of the errors in variable problem (Thomas 1994). Fama & Macbeth (1973) and Chen et al. (1986) recommend the grouping of stocks by making portfolios for reducing errors in variable problem and for mitigation of the noise in individual stock returns. In this way, stock returns errors will cancel each other and aggregate affect becomes negligible (Blume 1970). The core steps of portfolio formation process are:

1. Positioning the stocks having same characteristics to make the portfolios.
2. Factor premium will be estimated by using portfolio returns.
3. Using factor premium to explain return of the portfolio.

Fama and MacBeth (1973) estimation is also the most well-known technique to test the multifactor asset pricing models. It is also known as two-pass regression. For two-pass regression, two steps of regression have to be followed. In the first step, time-series regressions are run for time series data and after obtaining estimated beta, these

betas are then used as factor loading for the second step of regression which is required to be run on monthly basis for cross-sectional data. This step help to overcome the problem of regression residuals' cross-correlation by using rolling betas obtained in the first step. Thus Fama Macbeth procedure has inherited the problem of errors in variable which is then mitigated by using stylized portfolios. Following the procedure of Fama & French and Fama Macbeth methodologies, 6 multifactor models are proposed to test stock returns predictability in the context of the Pakistani equity market. These 6 models are i) Fama and French three-factor model, ii) two-pass regression for Fama and French three-factor model iii) proposed four-factor model, iv) two-pass regression for proposed four-factor model, v) proposed five-factor models vi) two-pass regression for proposed five-factor models.

3.5.4.1 Fama & French Three-Factor Model

For the construction of portfolios based on size, market capitalization is used to sort firms into big and small. Calculations are made at the end of the June each year (t-1), and after arranging the data in descending order; the data is then divided into two equal parts based on the observed median. Above median stocks are considered as "Big" while below-median are named as "Small".

After sorting the portfolios based on size, these are further divided based on high and low book to market ratio. After sorting and dividing the small and big portfolios based on book to market ratio, four sub-portfolios are constituted namely S/L (Small and low), S/H (Small and High), B/L (Big and low) and B/H (Big and high). These portfolios

are formed after one year lagged period to confirm that information is priced in the next year's stock returns.

Following the approach of Fama and French, (1992), our three-factors (market factors, size factor, and value factor) are constructed as follows which lead to our model 1.

$MKT_{i,t}= (Rm-RFR)$

$SMB_{i,t}= ½*[(S/L-B/L) +(S/H-B/H)]$

$HML_{i,t}=½*[(S/H-S/L) + (B/H-B/L)]$

3.5.4.2The Extended Frame Work: Proposed Four-factor Model

For the computation of performance factors, Accruals are categorized into low and high accruals. Using the same approach of sorting and dividing size and value-based portfolios, accruals are also further sorted based on low accruals (LAC) and high accruals (HAC), which result in the construction of 8 new sub-portfolios. These 8 portfolios are titled as *S/L/LAC, S/L/HAC, S/H/LAC, S/H/HAC, B/L/LAC, B/L/HAC, B/H/LAC, and B/H/HAC.* These portfolios are formed after one year lagged period to confirm that information is priced in the next year's stock returns.

Now following the approach of Fama and French, (1992), our four-factors (market factors, size factor, value factor, and performance factor) are constructed as follows which lead to our model 3:

$MKT_{i,t}= (Rm-RFR)$

$SMB_{i,t}=1/4*[(S/L/LAC-B/L/LAC) + (S/L/HAC-B/L/HAC) + (S/H/LAC-B/H/LAC) + (S/H/LAC-B/H/LAC)]$

$HML_{i,t}$=1/4*[(S/H/LAC-S/L/LAC) + (S/H/HAC-S/L/HAC) + (B/H/LAC-B/L/LAC) + (B/H/HAC-B/L/HAC)]

$ACC_{i,t}$=1/4*[(S/H/LAC-S/H/HAC) + (S/L/LAC-S/L/HAC) + (B/H/LAC-B/H/HAC) + (B/L/LAC-B/L/HAC)]

3.5.4.3 The Extended Frame Work: Proposed Five-Factor Model

To address the informational role of neutral trade-credit ratio (NTCR), accounts payables data has been used and collected from annual reports of the sample firms. The same Fama & French (1992) approach is used for the construction of portfolios based on information premium. For this purpose, size, value, and performance-based portfolios are further sorted into low and high NTCR. LNTC represents portfolios having low NTC whereas HNTC represents portfolios having high NTC. After sorting and dividing the portfolios, 16 sub-portfolios are constituted namely *S/L/LAC/LNTC, S/L/LACC/HNTC, S/L/HAC/LNTC, S/L/HAC/HNTC, S/H/LAC/LNTC, S/H/LAC/HNTC, S/H/HAC/LNTC, S/H/HAC/HNTC, B/L/LAC/LNTC, B/L/LAC/HNTC, B/L/HAC/LNTC, B/L/HAC/HNTC, B/H/LAC/LNTC, B/H/LAC/HNTC, B/H/HAC/LNTC, and B/H/HAC/HNTC.* These portfolios are formed after one year lagged period to confirm that information is priced in the next year's stock returns.

Again following the approach of Fama and French, (1992), our five-factors (market factors, size factor, value factor, performance factor and information factor) are constructed as follows:

$MKT_{i,t}$= (Rm-RFR)

$SMB_{i,t}$= 1/8*[(S/L/LAC/LNTC-B/L/LAC/LNTC) + (S/L/LAC/HNTC-B/L/LAC/HNTC) + (S/L/HAC/LNTC-B/L/HAC/LNTC) + (S/L/HAC/HNTC-B/L/HAC/HNTC) + (S/H/LAC/LNTC-B/H/LAC/LNTC) + (S/H/LAC/HNTC-B/H/LAC/HNTC) + (S/H/LAC/LNTC-B/H/LAC/LNTC) + (S/H/LAC/HNTC-B/H/LAC/HNTC)]

$HML_{i,t}$= 1/8* [(S/H/LAC/LNTC-S/L/LAC/LNTC) + (S/H/LAC/HNTC-S/L/LAC/HNTC) + (S/H/HAC/LNTC-S/L/HAC/LNTC) + (S/H/HAC/HNTC-S/L/HAC/HNTC) + (B/H/LAC/LNTC-B/L/LAC/LNTC) + (B/H/LAC/HNTC-B/L/LAC/HNTC) + (B/H/HAC/LNTC-B/L/HAC/LNTC) + (B/H/HAC/HNTC-B/L/HAC/HNTC)]

$ACC_{i,t}$= 1/8*[(S/H/LAC/LNTC-S/H/HAC/LNTC) + (S/H/LAC/HNTC-S/H/HAC/HNTC) + (S/L/LAC/LNTC-S/L/HAC/LNTC) + (S/L/LAC/HNTC-S/L/HAC/HNTC) + (B/H/LAC/LNTC-B/H/HAC/LNTC) + (B/H/LAC/HNTC-B/H/HAC/HNTC) + (B/L/LAC/LNTC-B/L/HAC/LNTC) + (B/L/LAC/HNTC-B/L/HAC/HNTC)]

NTCR=1/8 * [(S/L/LAC/LNTC-S/L/LAC/HNTC) + (S/L/HAC/LNTC-S/L/HAC/HNTC) + (S/H/LAC/LNTC-S/H/HAC/HNTC) + (S/H/HAC/HNTC-S/H/HAC/HNTC) + (B/L/LAC/LNTC-B/L/LAC/HNTC) + (B/L/HAC/LNTC-B/L/HAC/HNTC) + (B/H/LAC/LNTC-B/H/HAC/HNTC) + (B/H/HAC/HNTC-B/H/HAC/HNTC)]

Chapter IV

4. Results and Discussion

This chapter covers:

4.1: Results of Trade Credit Extension Motives

4.2: Results of Bank Loans and Trade Credit Demand

4.3: Results of Trade Credit Supply and Firm Performance

4.4: Results of Trade Credit and Stock Return Predictability

The chapter presents the key findings of trade credit extension motives along with the substitution hypothesis of trade credit and short term bank loans and their role in determining the performance of firms. It also presents stock returns predictability, along with empirical results and theoretical discussion. Four main models have been empirically tested one by one and their results are mentioned including six sub-models of asset pricing. Descriptive statistics, Correlation matrix, and panel estimation results are presented for all four models separately as variables and sample size varies for each model whereas results of stock return predictability are based on portfolio analysis and include regression results for 3-factor, 4-factor, 5-factor models, and finally two-pass regression tests for six sub-models are also presented separately.

4.1 Results of Trade Credit Extension Motives

Below are the Descriptive Analysis, Pearson Correlation Coefficient, and dynamic panel data estimation results of testing the motives behind the extension of trade credit for the sample from manufacturing firms of Pakistan.

4.1.1 Descriptive Analysis

Table 4.1 below presents mean, standard deviation, minimum and maximum values of eight variables used in the model (1) for 150 firms operating in PSX for 12 years. Table 4.1 shows that on average, the sample firms are extending 8.9% of trade credit (TCS) to their buyers along with firms supplying no trade credit to 61.5% of maximum trade credit supply which represents a significant amount of investment in accounts receivables. 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 have 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 a maximum of 83.84%. For sales growth (SG), firms have 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, natural log has been taken and it has a mean value of 8.047 with a maximum of 11.657 and a minimum of 3.897 value. 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 drastic decrease in current liabilities in a particular year and a minimum liquidity level is around closer to zero for few firms in our sample.

Table 4.1: Descriptive Statistics for Trade Credit Extension Motives

Variables	Obs.	Mean	Std. Dev.	Min	Max
TCS	1800	*.089*	*.102*	*.00*	*.62*
PROF	1800	*.060*	*.096*	*-.54*	*.73*
STD	1800	*.195*	*.145*	*.00*	*.75*
GM	1800	*.132*	*.300*	*-6.60*	*.84*
SG	1800	*.148*	*.552*	*-1.00*	*13.32*
HHI	1800	*.030*	*.091*	*.00*	*.990*
SIZE	1800	*8.047*	*1.383*	*3.90*	*11.66*
LIQ	1800	*1.585*	*4.512*	*.001*	*138.53*

Notes: TCS is Trade Credit supply, PROF is Profitability, 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.

4.1.2 Correlation Analysis

To analyze the motives of trade credit extension, the independent relationships and associations were required to be tested among all variables. For this purpose, the Pearson Correlation Coefficient is used to fulfill the aim by using data of 1800 observations for 150 manufacturing firms listed on PSX for 12 years and computations are presented in Table 4.2.

Table 4.2: Pearson Correlation Matrix for Trade Credit Extension Motives

Variables	TCS	PROF	STD	GM	SG	HHI	SIZE	LIQ
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

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.

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 (Gujarati, 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 surpasses the range of .80, so multicollinearity is not an issue to carry further analysis.

4.1.3 Dynamic Panel Estimation Results

Following the trade credit relationship theory (Bastos, 2010) which argues 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). Therefore, one-period lag effect of trade credit supply is added in the model to get a more realistic picture of the trade credit extension motives. Table 4.3 presents the SYS-GMM estimation results of the model (1a), which explicitly incorporates the lag-effect of trade credit supply.

Table 4.3: Dynamic panel Estimation results for Trade Credit Extension Motives

Variables	Blundell-Bond (Two-step)	
TCS (Dependent Variable)	Coefficients	Standard Errors
PROF	.052***	.011
STD	.061***	.008
GM	-.001	.002
SG	.004***	.001
HHI	-.029	.037
SIZE	-.017***	.002
LIQ	-.0002**	.000
TCS(-1)	.467***	.011
Intercept	.161***	.014
Instruments	73	
Sargan (p-value)	.214	
AR(1) (p-value)	.000	
AR(2) (p-value)	.789	
Observations	1650	
No. of Firms	150	

Notes: Here the dependent variable is TCS, TCS_{t-1} is the one period lagged 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 *** 1% significance level, ** 5% significance level, *10% significance level.

Table 4.3 shows the results of Panel estimation for trade credit extension motives. The positive and significant values of PROF and STD suggest that cash-rich firms have strong profitability and better access to external markets through granting higher trade credit to their customers. This result also supports our hypothesis *(H_1)* that in the context of Pakistan, manufacturing firms consider trade credit financing as a strategic investment decision to maintain and retain long term relationships with customers. Keeping in view the helping hand motive, results suggest that the Pakistani firms having access to external sources of finance are willing to extend trade relationships by granting trade credit to financially constrained firms. These results are consistent with the commercial motive of trade credit supply (Boden & Paul 2014; Hofmann & Kotzab, 2010; Jain, 2001; Wilson, 2008). Gross margin (GM) is found to have a negative relationship with TCS in the context of the Pakistani manufacturing firms. This result suggests that profitable firms having high gross margins and having the capacity to sale additional units on discriminated price by grating trade credit are not generously facilitating and supplying trade credit. On the other hand, less profitable firms are more inclined to grant trade credit to support their decreasing sales. Similar findings are reported by Garcia-Teruel and Martinez-Solano, (2010) in the context of European firms but the price discrimination motive *(H_2)* is found to be insignificant in the context of Pakistan. For commercial motive, sales growth (SG) has a positive and significant relation with trade credit supply which indicates that the Pakistani manufacturing firms, having positive sales growth allow more credit sales to their customers to promote continuous business so as to finance further growth (Chee et al., 1999; Peterson & Rajan, 1997). The results are supporting our hypothesis *(H_3)* that the Pakistani firms are following commercial strategy

by supplying trade credit as an instrument to support their sales growth. The value of the HHI coefficient is negative which supports the argument that concentrated markets are reluctant in offering trade credit and hence demand cash payments. But this result is found to be insignificant in the context of the Pakistani manufacturing firms which indicates that a concentrated market has no impact on trade credit supply. The size has a significant negative impact on TCS which is in line with market power theory and large size Pakistani manufacturing firms have more bargaining power in buyer-seller relations 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 are found to be insignificant which suggest that the Pakistani firms' liquidity has no significant impact on trade credit supply. For lagged trade credit supply, results are found to be significantly positive and the coefficient is less than one which suggests that the Pakistani manufacturing firms do maintain an optimal ratio for extending trade credit to their customers. This finding is supporting trade credit relationship theory which suggests that firms do consider the history of trade credit relationships and tend to supply trade credit on a continuous basis to maintain long term business relationships. The speed of adjustment is (1-0.467= 0.533) at which sample firms adjust their trade credit extension. These findings are found to be consistent with Ahmad (2017) who found that the Pakistani manufacturing firms make adjustments in their trade credit supply level at a higher cost. Therefore, it is confirmed that trade credit extension is dynamic in nature and firms do make partial adjustments in their policies but at a relatively slow speed as it may result in high adjustment cost.

4.2 Results of Bank Loans and Trade Credit Demand

Below are the Descriptive Analysis, Pearson Correlation Coefficient, Diagnostics and Panel estimation results of the substitution hypothesis of trade credit and bank loans for 136 sample manufacturing firms of Pakistan.

4.2.1 Descriptive Analysis

The mean with standard deviation, minimum and maximum values of six variables used in the model (2) are given below in Table 4.4

Table 4.4: Descriptive Statistics for Substitution Hypothesis

Variables	Obs.	Mean	Std. Dev.	Min	Max
TCD	1632	.12	.12	0	0.90
STD	1632	.21	.14	0	0.85
INV	1632	8.69	15.82	0	308.38
LEV	1632	1.59	3.947	0	97.8
PROF	1632	.058	.10	-0.54	0.65
SIZE	1632	8.08	1.39	3.9	12.52

Notes: TCD is the trade credit demand, STD is the proxy for short term debt, INV represents inventory turnover, LEV represents leverage ratio, PROF represents profitability, and size is natural log of total assets.

Table 4.4 represents that the total number of observations is 1632, while the mean, standard deviation, minimum and maximum values of all variables are also covered. Table shows that trade credit demand (TCD) of the sample as the Pakistani manufacturing firms is minimum of zero and maximum of 90% of total assets which shows that some of the sample firms heavily rely on short term financing and a high proportion of TCD is an indicator of financial distress (Taj et al., 2017) with an average of 12% of TCD. For short term debt variable (STD), data contains sample firms having no short term debt to a maximum 85% debt of total assets which shows the aggressive

attitude of firms towards short term financing along with risk-taking behavior. For inventory (INV), on average the Pakistani manufacturing firms have 8.69 times of inventory turnover along with firms having zero turnover-ratio to a maximum of 308.38 times turnover. The extreme figure shows the quick conversion of production into sales and decrease in inventory. For leverage, the mean value is 1.59 which suggests that the Pakistani manufacturing firms are maintaining optimal capital structure whereas a minimum ratio is zero and a maximum is 97.8. As far as profitability is concerned, on average ROA is 0.058 with a minimum value of -0.54 which shows net loss and maximum of 0.65 value. For Size, natural log of total assets has been taken and its mean value is 8.047 while the min. value is 3.897, max. value is 11.657 and a standard deviation is 1.383.

4.2.2 Correlation Analysis

To analyze the relationship between short term bank borrowing and trade credit demand, the independent associations among all variables were required to be tested before proceeding to the other estimation techniques. For this purpose, the Pearson Correlation Coefficient is applied to fulfill the aim in Table 4.5 for six variables. Pearson correlation is used to test the association among variables and a correlation of greater than .8 shows strong correlation and indicates the chances of multicollinearity (Gujarati, 2009). As the result shows in table 4.5, none of our variables is strongly related to other and all variables have weak correlation. STD has a significant but weak correlation with INV, LEV, PROF and SIZE. Our results show that none of our value reaches the range of .8 and exceeds the range of .8, so multicollinearity issues will not disturb further analysis.

Table 4.5: Pearson Correlation Matrix for Substitution Hypothesis

VAR	TCD	STD	INV	LEV	PROF	SIZE
TCD	1					
STD	.004	1				
INV	-.019	-.142***	1			
LEV	.033	.173***	.027	1		
PROF	.003	-.267***	.040	-.155***	1	
SIZE	-.231***	-.051**	-.045*	.025	.151***	1

Notes: TCD is the trade credit demand, STD is the proxy for short term debt, INV represents inventory turnover, LEV represents leverage ratio, PROF represents profitability, and size is natural log of total assets.

4.2.3 Endogeneity Test

Although previous researches pointed out the two-way causality between trade credit demand and short term debt (Ying *et al*., 2014) yet, it is necessary to test the presence of endogeneity issues in our data set before testing any further relationships. To empirically test the endogeneity issue, Wu-Hausman test (*estatendog*) is applied using interest expense (IE) and Liquidity (LIQ) as instrumental variables having a null hypothesis of exogenous variables. The results of table 4.6 suggest that the null hypothesis is rejected as p–value is less than 0.05 and recommends the estimation applying two-stage least square.

Table 4.6: Wu-Hausman Test (Instruments IE, LIQ)

Regressors	STD, TCD
Wu-Hausman	7.670
P-value	.006

Note: STD is short term debt and TCD is trade credit demand

4.2.4 2SLS Panel Estimation Results

Following the ‘‘flow in-stock-flow out’’ pattern of trade credit presented by Benishay (1968), which states that the current demand for trade credit is strongly determined by the

history of previous available trade credit. Therefore, it is necessary to add one-period lag term of trade credit for having a realistic picture of the substitution hypothesis. For this purpose, we used one-period lag term of dependent variable i.e. dynamic panel model to address this issue. The presence of two-way causality suggests the estimation of results with two-stage least square therefore, Table 4.7 presents the results of the 2SLS estimation of model (2, 2a), having the lag-effect of trade credit along with instrumental variables LIQ (Liquidity) and IE (Interest Expense).

Table 4.7: 2SLS Estimation results for Substitution Hypothesis

Variables	2-Stage-Least-Square	
TCD (Dependent Variable)	Coefficients	Standard Errors
STD	.118**	.053
INV	.0001	.000
LEV	.0002	.001
PROF	.057*	.030
SIZE	-.008***	.019
TCD(-1)	.654***	.019
Intercept	.069***	.020
R-squared	0.475	
Observations	1496	
No. of Firms	136	

Notes: Here the dependent variable is TCD, TCD_{t-1} is the one period lagged trade credit demand, STD is the proxy for short term debt, INV represents inventory turnover, LEV represents leverage ratio, PROF represents profitability, and size is natural log of total assets. *** 1% significance level, ** 5% significance level, *10% significance level.

Table 4.7 shows the results for 2SLS estimation for trade credit and bank borrowing. The results indicate that STD has a significant positive impact on TCD which suggests that trade credit complements bank borrowing in the context of Pakistan. This result supports our hypothesis *(H_5)* and shows that approval of funds or credit from one source may signal the quality of borrower hence increases the chance of getting the credit from other sources. For instance, banks follow their SOPs and perform a proper screening

process of customer scrutiny before granting loans. This screening and scrutiny process signals the trade credit lenders about the creditworthiness of customers (Agostino & Trivieri 2014; Psillaki & Eleftheriou 2015; Andrieu & Staglianò, 2018).

This complementary relationship is also supported by Andrieu et al., (2018) who suggested that having both modes of financing provide positive signals about the creditworthiness of the customers and accelerates the process of additional future credit grant. INV has a positive relationship with TCD with weak coefficient power and in-significant p-value which suggests TCD decreases when inventory conversion leads into a sales increase. The more quickly inventory is converted into sales the less trade credit is needed. LEV also has a positive relationship with trade credit demand which suggests that financially distressed firms usually face difficulty in acquiring bank debt therefore, they rely more on alternative financing modes. The results are found to be consistent with Kim, (2014) in the context of Korean firms but this relationship is found to be insignificant in the context of Pakistan. Similarly, PROF is found to be positively related to trade credit demand which implies that profitable firms channel their funds to other investments and receive more trade credit from suppliers as being more creditworthy. The size is found to be negatively affecting TCD which implies that large firms use less trade credit as they are more creditworthy and have good reputation hence they have more credit capacity of affording other modes of financing (Garcia-Teruel & Martinez-Solano, 2014). The positive relationship of TCD with TCD (-1) suggests that firms maintain a long term relationship with suppliers and demand trade credit on the basis of their previous credit relationship. This finding is also supported by the trade credit

relationship theory (Bastos, 2010). The estimated coefficient of the one-period lagged term TCD (-1), 0.654 is highly significant which indicates a strong persistence of trade credit demand. This suggests that previously demanded trade-credit affects the current demand and therefore, it should be considered while making any credit decision. Furthermore, positive sign is the indication that there exists a reinforcing effect of lag trade credit. That is, firms' previously received trade credit supports in retaining and attaining more trade credit in the current period. Lastly, our R-Square value is .457 which suggests that 45.7% variation in TCD is explained by the explanatory variables.

4.3 Results of Trade Credit Supply and Firm Performance

This section has aimed to test the impact of late payments of trade credit on the performance of manufacturing firms of Pakistan. In this regard, Descriptive Analysis, Pearson Correlation Coefficient, and Dynamic Panel estimation results are presented and discussed below.

4.3.1 Descriptive Analysis

The mean with standard deviation, along with minimum and maximum values of six variables used in the model (3) are given below in Table 4.8.

Table 4.8 below shows on average Gross Margin (GM) is 16.3% with a minimum value of -54.3% which shows gross loss and a maximum of 60.2%. An average value of Days Sales outstanding suggests that firms are receiving their payments against sales within 26 to 27 days whereas long overdue payments are taking almost a year. For

liquidity, on average liquidity (LIQ) is maintained at 1.46:1 but our sample also contains highly liquid firms having a liquidity ratio of 10.55 and a minimum liquidity level is closer to zero for few firms in our sample. As far as leverage is concerned, the mean value of leverage is 0.428 which suggests that the Pakistani manufacturing firms are using debt with a balanced ratio whereas a minimum ratio is zero and a maximum is 94.7%. The maximum value of leverage suggests that few of sample firms heavily rely on debt which shows their financial distress. For revenue growth (RG), firms have an average growth of 12.8% along with firms having negative growth to 1.87 times of maximum revenue growth.

Table 4.8: Descriptive Statistics for Late Payments and Firm Performance

Variables	Mean	Maximum	Minimum	Std. Dev.	Observations
GM	.163	.602	-.543	.114	1386
DSO	27.661	296.89	.011	29.588	1386
SIZE	8.312	13.385	4.358	1.336	1386
LIQ	1.458	10.546	.001	1.070	1386
DR	.428	0.947	0	.266	1386
RG	.128	1.871	-.634	.274	1386

Notes: GM is Gross Margin, DSO is Days sales Outstanding, Size is Natural log of Total Assets, LIQ is Liquidity Ratio, DR is Debt ratio and RG is Revenue Growth.

4.3.2 Correlation Analysis

To analyze the impact of late payments on performance of the Pakistani manufacturing firms, the independent associations among all constructs needed to be examined. For this purpose, the Pearson Correlation Coefficient is checked to fulfill the aim. The following correlation matrix is found by using data of 11 years for 126 manufacturing firms listed on PSX with 1386 observations as presented in Table 4.9.

Table 4.9: Pearson Correlation Matrix for Late Payments and Firm Performance

Correlation	GM	DSO	SIZE	LIQ	DR	RG
GM	1					
DSO	-.073***	1				
SIZE	.143***	-.170***	1			
LIQ	-.247***	-.006	.006	1		
DR	-.271***	-.219***	.129***	-.396***	1	
RG	.101***	-.081***	-.008	-.073***	.089***	1

Notes: GM is Gross Margin, DSO is Days sales Outstanding, Size is Natural log of Total Assets, LIQ is Liquidity Ratio,DR is Debt ratio andRG is Revenue Growth. *** 1% significance level, ** 5% significance level, *10% significance level.

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

4.3.3 Dynamic Panel Estimation Results

This section provides the regression results by using Two-Step System GMM for the hypotheses developed on the basis of historical literature related to the consequences of trade credit extension along with the discussion of results. The selection of estimation technique is based on the assumptions of Two-Step System GMM which suggest the lag effect of the dependent variable and causes of auto-correlation when the sample is small in terms of the time period.

Table 4.10: Dynamic panel Estimation Results for Late Payments and Firm Performance

Variables	Two-Step System GMM	
GM (Dependent Variable)	Coefficients	Standard Errors
DSO	.003	.006
SIZE	-.024**	.010
LIQ	-0.19	.022
DR	.095***	.036
RG	-.104	.068
GM (-1)	1.270***	.209
Intercept	.149***	.085
Instruments	16	
AR(1) test (p-value)	.000	
AR(2) test (p-value)	.489	
Difference-in-Hansen test (p-value)	.963	
Observations (Adjusted)	1260	
No. of Firms	126	

Notes: Here GM is Gross Margin, DSO is Natural log of Days sales Outstanding, DR is Debt ratio, LIQ is Liquidity Ratio,RG is Revenue Growth, Size is Natural log of Total Assets and GMt-1 is lagged Gross Margin.*** 1% significance level, ** 5% significance level, *10% significance level.

Table 4.10 shows that in the context of Pakistan, DSO is positively affecting the firms' performance, which rejects our hypothesis (H_6), but this result is insignificant. Paul et al., (2018) suggested two more measures for estimation of late payments which are based on average credit terms. The inclusion of these proxies may provide valuable or significant results but unfortunately, in Pakistan lack of availability of data related to credit terms weakened our research findings. The size is found to have a significant negative impact on firms' performance which indicates the managerial inefficiency of management in utilizing their resources for sales generation. These results are also supported by Singhania and Mehta (2017) in the context of Pakistan. Similarly, liquidity (LIQ) is also proved to have a negative relationship with a gross margin which suggest

that the Pakistani firms are more concerned about maintaining liquidity hence are preserving idle resources that may be invested in short term investments but the results are insignificant.

On the other hand, leverage (DR) is found to have a significant negative relationship with firms' performance which implies that excess use of debt signals the stress level of the firms therefore, they are unable to invest in profitable ventures or increase their sales growth. These results are supported by Martínez-Sola et al., 2014 and Tang, 2014. The negative relationship between revenue growth (RG) and firms' performance provided us insight under the neo-classical view which argues that firms exhaust all their profits in pursuing growth opportunities but experience a decline in profit rates. Moreover, managerial objective of the firm also suggests that managers tend to maximize their growth rather than profits which results in the possibility that growth victimize the profits. Lastly, lagged gross margin is also found to be positive and statistically significant.

4.4 Results of Trade Credit Supply and Stock Returns Predictability

Below are Descriptive Analysis, Pearson Correlation Coefficient and regression results of stock returns predictability and trade credit in the context of Pakistan.

4.4.1 Descriptive Analysis

The mean with standard deviation, minimum and maximum values of monthly average returns of all portfolios sorted on the basis of size, book to market ratio, accruals, and neutral trade-credit ratios for the period of 2007 to 2017 are given below in the Table

4.11. Results are reported for big (B) sized firms in Panel 1 and small (S) firms in panel 2.

Table 4.11: Descriptive Statistics of all portfolios

Portfolios	Mean	Standard Deviation	Kurtosis	Skewness	Min	Max
P	.0061	.0754	1.3215	-0.0034	-0.2044	0.2866
Panel 1: Descriptive of Big sized portfolios						
B	.0012	.0728	1.9895	-.2014	-.1981	.2772
B/L	.0006	.0648	3.0650	.2081	-.1848	.2972
B/H	.0023	.0802	.6331	-.5219	-.2262	.2063
B/L/LAC	.0048	.0625	3.1972	.1736	-.1928	.2845
B/L/HAC	-.0011	.0809	2.5617	-.1538	-.2464	.3334
B/H/LAC	.0047	.0882	2.3102	-.5855	-.3395	.2602
B/H/HAC	.0040	.0934	1.1713	.0036	-.2728	.3095
B/L/LAC/LNTC	.0066	.0712	2.0912	.1767	-.2448	.2873
B/L/LAC/HNTC	.0009	.0739	2.7586	.0164	-.2653	.3037
B/L/HAC/LNTC	-.0023	.1017	5.4365	.3672	-.3844	.4879
B/L/HAC/HNTC	.0008	.0841	2.4913	-.8173	-.3584	.2381
B/H/LAC/LNTC	.0018	.0865	1.0911	-.0920	-.3015	.2417
B/H/LAC/HNTC	.0081	.1244	6.0289	-.2713	-.5792	.5162
B/H/HAC/LNTC	.0051	.1172	7.3422	.9294	-.3598	.6338
B/H/HAC/HNTC	.0027	.1022	2.6971	-.1170	-.3701	.3886
Panel 2: Descriptive of Small sized portfolios						
S	.0106	.0911	5.2569	.8861	-.2823	.4817
S/L	.0079	.0787	2.4273	.6192	-.1658	.3509
S/H	.0116	.0851	1.1440	.3693	-.1923	.2890
S/L/LAC	.0070	.0769	.5621	.2169	-.1722	.2788
S/L/HAC	.0020	.0914	5.0609	.9653	-.2135	.4730
S/H/LAC	.0089	.0967	2.5344	-.0173	-.3799	.3300
S/H/HAC	.0095	.0930	.2840	.1494	-.2157	.2481
S/L/LAC/LNTC	.0083	.0935	.6851	-.2224	-.2787	.2613
S/L/LAC/HNTC	.0023	.0878	.3012	-.1082	-.2208	.2643
S/L/HAC/LNTC	.0072	.1132	3.8679	.1791	-.4875	.4599
S/L/HAC/HNTC	.0096	.1233	12.5573	1.8309	-.3412	.8042
S/H/LAC/LNTC	.0029	.1312	3.7521	-.0152	-.5317	.4104
S/H/LAC/HNTC	.0114	.1170	.8337	-.0300	-.3079	.3688
S/H/HAC/LNTC	.0051	.1021	1.3721	-.4344	-.3570	.2819
S/H/HAC/HNTC	.0135	.1073	.8307	.3032	-.2671	.3309
MKT	.0010	.0707	16.1540	-2.4707	-.4605	.1707
SMB	.0052	.0545	3.7848	-.1446	-.1734	.1569
HML	.0026	.0461	4.6760	-.2527	-.1659	.1425
ACC	.0010	.0425	7.1013	-.8513	-.2086	.1201
NTC	.0018	.0416	7.4713	.4707	-.1685	.1914

Note: Here P represents portfolio of all sample firms in sample period. S and B represent size i.e. small and big. L and H are Low book to market ratio and High book-to-market ratio respectively. HAC and LAC indicate sorting on the basis of high accruals ratio and low accruals ratio. LNTC and HNTC are the low neutralized trade credit ratio and high neutralized trade credit. MKT is market return in excess of Rfr, SMB is small minus big, HML is high minus low, ACC is LAC-HAC and NTC is HNTC-LNTC.

This table shows that the average return of all sample firms is 0.61% and the standard deviation is 7.54%. Similarly, for the big-sized firm, the average return is 0.12% and the standard deviation is 7.28%. For small size firms, the average return is 1.06% and the standard deviation is 9.11%. Comparing both means of size sorted portfolios; it is evident that small stocks are considered more risky hence they earned more returns. The standard deviation of SMB is much lower than S and B which satisfies the purpose of constructing portfolios i.e. minimization of idiosyncratic volatility. On the other hand, when comparing descriptive statistics of low book-to-market and high book-to-market portfolios, it is indicated that in terms of high average returns, low book-to-market portfolios outperformed high book-to-market portfolios along with possessing high risk. Similarly, accruals of small firms also outperformed big sized firms' accruals and average returns of small-sized firms sorted on the basis of neutralized trade-credit ratio also outperformed.

4.4.2 Correlation Analysis

To test the association between all factors, the correlation matrix is computed by using the data on average monthly returns of 90 stocks for the period 2007-2017 with 132 observations. Computations are presented in Table 4.12 for five-factors. The table shows a correlation among all factors including Fama and French 3-factors along with information factor and performance factor.

Below table 4.12 presents the correlation matrix for five factor model. Results show that SMB has a significant but weak correlation with market factor and accruals whereas net trade credit ratio (NTCR) is significantly related to HML and ACC which are

value premium and performance premium factors respectively. As the result shows, none of the factors from our five-factor model is strongly related to other and all variables have weak correlation and none of our values reaches or surpasses the range of .8, so multicollinearity issue does not affect the estimation results.

Table 4.12: Pearson Correlation-Five-factor Model

	MKT	*SMB*	*HML*	*ACC*	*NTCR*
MKT	1				
SMB	-.086***	1			
HML	-.010	.245	1		
ACC	-.134	.224***	.340***	1	
NTCR	.063	-.050	-.242***	-.240***	1

Note: Here MKT represents Market return in excess of RFR, SMB is Size premium, HML is value premium, ACC is performance premium sand NTCR is information premium.

4.4.3 Regression Results Fama & French Three-factor Model

Results reported in Table 4.13 show the relationship of market, size factor and value factor with stock returns of the portfolios that are sorted on the basis of size (small, big) and book to market ratio (high/low). According to the Fama and French three-factor model results, it is found that market factor is positively predicting future returns for firms sorted only on the basis of market capitalization. Coefficients of size factor are statistically significant for small firms' portfolios whereas, for big firms' portfolios, the size factor is negatively predicting future returns for firms having high value. Furthermore, the value premium is negatively and significantly predicting returns of low book-to-market ratio and firms' portfolios are positively related to high book to market

ratio of firms. The explanatory power of the three-factor model varies across the portfolios. On the basis of the above findings, it is suggested that investors or portfolio managers can design their investment strategies keeping in view these sorted portfolios.

Table 4.13: Regression results from Fama & French three-factor Model

Dependent variable	C	MKT	SMB	HML	R^2
$R_{pt} - R_{ft} = \alpha_t + \beta_1(R_{mt} - R_{ft}) + \beta_2(\mathrm{SMB_t}) + \beta_3(\mathrm{HML_t}) + \mu_t$					
P	-.0044	.1719*	.2618**	.0536	.057
S	-.0035	.1759*	.7632***	-.2163	.224
B	-.0057	.1640*	-.1315	-.1345	.045
S/L	-.0047	.1276	.6245***	-.3199**	.226
S/H	-.006	.1284	.8965***	.6893***	.468
B/L	-.006	.1284	-.1035	-.3107***	.085
B/H	-.0047	.1276	-.3755***	.6801***	.252

Note: Here P represents portfolio of all sample firms in sample period. S and B represent size i.e. small and big. L and H are Low book to market ratio and High book-to-market ratio respectively.

4.4.4 Two-Pass Regression Results Fama & French Three-factor Model

Results for Fama Macbeth regression and Fama and French three-factor model are reported in Table 4.14. For two-pass regression methodology, time series linear regression is applied for estimating rolling betas which are then used for estimating cross-sectional betas. These estimated betas are then used for estimating the relationship of market, size factor and value factor with stock returns of the portfolios that are sorted on the basis of size (small, big) and book to market ratio (high low).

According to the Fama Macbeth regression resultsin table 4.14, it is found that the Fama and French three-factor model is not helpful in determining the portfolio's future

returns in the context of Pakistan. Low explanatory powers also suggest the failure of the three-factor model.

Table 4.14: Two-pass Regression results from Fama& French three-factor Model

Dependent variable/ Sub-Portfolios	C	MKT	SMB	HML	R^2
$(R_{pt} - RFR) = \alpha_t + \gamma_{MKT,t}\hat{\beta}_{MKT} + \gamma_{SMB,t}\hat{\beta}_{SMB} + \gamma_{HML,t}\hat{\beta}_{HML} + \varepsilon_{i,t}$					
P	.0577	-.2077	-.0141	-.0706	.0803
S	-.019*	-.1806	.0749	.005	.0532
B	.0109	-.0831	.0029	-.0058	.0117
S/L	-.0162	-.0318	.0551	.0163	-.0244
S/H	-.068*	-.2247	.0682	.0454	.0499
B/L	.017	-.0421	.0384	.0396	.0168
B/H	.009	-.1286	.0509	.0271	.0345

Note: Here P represents portfolio of all sample firms in sample period. S and B represent size i.e. small and big. L and H are Low book to market ratio and High book-to-market ratio respectively.

4.4.5 Regression Results for Four-Factor Model

Results reported in Table 4.15 show the relationship of market, size factor, value factor and performance factor with stock returns of the portfolios that are sorted on the basis of size(small, big), book to market ratio (high low) and Accruals (low high).

Table 4.15 shows that the four-factor model outperformed and successfully explained the returns of all stylized portfolios. MKT is found to be significant for all portfolios therefore, providing empirical support to CAPM validity in Pakistan. Size premium also provides strong support in predicting stock returns with positive coefficients hence supporting the traditional size anomaly which states that small firms are considered as more risky firms due to low capitalization and are more sensitive to the macro-economic shocks therefore, high returns are required by the investors.

On the other hand, the value premium is providing mixed results that vary across portfolios. For instance, portfolios sorted on the basis of size and further sorted on the basis of low value are negatively predicting stock returns. High-value portfolios outperformed the low-value portfolios with all sub-portfolios. For Accruals, average returns sorted on the basis of accruals are providing significant results and particularly portfolios of High accruals show a negative coefficient. This finding is consistent with Kothari et al. (2006) who found that managers overstate their earnings which result in overpriced equity and therefore, result in negative future stock returns.

Table 4.15: Regression Results for Proposed Four-Factor Model

Dependent variable/ Sub-Portfolios	C	MKT	SMB	HML	ACC	R^2
$R_{pt} - R_{ft} = \alpha_t + \beta_1(R_{mt} - R_{ft}) + \beta_2(SMB_t) + \beta_3(HML_t) + \beta_4(ACC_t) + \mu_t$						
P	-.0086	-.9863***	1.9960***	.0134	-.0054	.9972
S	-.0032	-1.1259***	2.1815***	-.1658**	-.1200	.8356
B	-.0112	-.7846***	1.6256***	-.0770	-.1708**	.7770
S/L	-.0040	-.9086***	1.7530***	-.4076***	-.0080	.7035
S/H	-.0040	-.8515***	1.5942***	.8132***	-.0867	.7252
B/L	-.0105***	-.6906***	1.4128***	-.2995***	-.1206	.7394
B/H	-.0134***	-.7228***	1.5163***	.5983***	.2676**	.6349
S/L/LAC	-.0077*	-.9094***	1.8012***	-.3461***	.8225***	.6772
S/L/HAC	-.0092**	-.9593***	1.8312***	-.3805***	-.3880***	.7041
S/H/LAC	-.0095*	-.7274***	1.4462***	1.0717***	.7441***	.6635
S/H/HAC	-.0051	-.8067***	1.4975***	.8471***	-.3997***	.6274
B/L/LAC	-.0070**	-.7121***	1.3859***	-.2750***	.1762**	.6257
B/L/HAC	-.0115***	-.7572***	1.6072***	-.4450***	-.3722***	.7511
B/H/LAC	-.0113**	-.9891***	1.9922***	.1027	.4957***	.6638
B/H/HAC	-.0096**	-.8148***	1.6896***	.5317***	-.6016***	.7307

Note: Here P represents portfolio of all sample firms in sample period. S and B represent size i.e. small and big. L and H are Low book to market ratio and High book-to-market ratio respectively. HAC and LAC indicate sorting on the basis of high accruals ratio and low accruals ratio.

4.4.6 Two-pass Regression Results from Proposed Four-Factor Model

Results for the Fama Macbeth four-factor model are reported in Table 4.16. For the two-pass regression methodology, time series linear regression is applied for estimating rolling betas which are then used for estimating cross-sectional betas. These estimated betas are then used for estimating the relationship of market, size factor, value factor and performance factor with average stock returns of the portfolios that are sorted on the basis of size(small, big), book to market ratio (high low) and Accruals (low high).

Table 4.16: Two-pass Regression Results from Proposed Four-Factor Model

Dependent variable/ Sub-Portfolios	C	MKT	SMB	HML	ACC	R^2
$(R_{pt} - RFR) = \alpha_t + \gamma_{MKT,t}\hat{\beta}_{MKT} + \gamma_{SMB,t}\hat{\beta}_{SMB} + \gamma_{HML,t}\hat{\beta}_{HML} + \gamma_{ACC,t}\hat{\beta}_{ACC} + \varepsilon_{i,t}$						
P	.2620	-.0131	-.1328	-.7091	2.2603	.0537
S	-.0158*	-.436	-.2173	.1043**	-.0402	.0635
B	.0568	.1007	.0117	-.0907*	.0983	.0703
S/L	-.1170*	-.3409**	-.1028**	.0816	-.0279	.0815
S/H	-.1634**	-.1734**	-.0165	.0746**	.1184	.0903
B/L	.0352	-.0237	-.0376	-.0246	.0835	.0479
B/H	.1544**	.1609*	.0186	-.0876**	-.0227	.0786
S/L/LAC	-.2152***	-.2578**	-.0649	-.0447	.0544	.1149
S/L/HAC	-.0826	-.114	-.0118	.0747	-.0417	.0267
S/H/LAC	-.1518*	-.0984	.0342	.0096	.0274	.0503
S/H/HAC	-.0554	-.3379**	-.1345	-.0474	.0055	.0839
B/L/LAC	-.0030	.0508	.0107	-.0922	-.0021	.0281
B/L/HAC	-.0256	.0350	.0403	.0017	.0379	.0207
B/H/LAC	-.0156	.0085	.0136	-.0454	.0089	.0336
B/H/HAC	.1574	.2029**	.0414	-.1356*	-.0194	.0637

Note: Here P represents portfolio of all sample firms in sample period. S and B represent size i.e. small and big. L and H are Low book to market ratio and High book-to-market ratio respectively. HAC and LAC indicate sorting on the basis of high accruals ratio and low accruals ratio. MKT is market return in excess of Rfr, SMB is small minus big, HML is high minus low and ACC is LAC-HAC.

According to the Fama Macbeth regression results, it is found that the four-factor model is not helpful in determining the relationship of future stock returns with SMB, HML and ACC for all sorted portfolios for the sample period in the context of Pakistan. Few significant coefficients of MKT and HML provide little help in predicting future stock returns but low explanatory powers suggest the failure of four-factor model.

4.4.7 Regression Results from Proposed Five-Factor Model

Results reported in Table 4.17 shows the relationship of market, size factor, value factor and performance factor with stock returns of the portfolios that are sorted on the basis of size(small, big), book to market ratio (high low), Accruals (low high) and net trade credit ratio (low, high).

Table 4.17 shows that with the inclusion of the 5^{th} factor in the model i.e. net trade credit ratio, R-square has decreased significantly for portfolio "p" and market factor has become insignificant except for few sub-portfolios but SMB is highly significant with mixed directions. HML and ACC have few insignificant coefficients. NTCR is highly significant for most of the sub-portfolios with positive coefficient which supports our hypothesis *(H_7)* and suggests that supplier's information advantage, measured by using proxy of net trade credit ratio, predicts stock returns significantly beyond the known predictors such as MKT, SMB, HML, and ACC. A noticeable significant negative coefficient of small firms having high book to market ratio with low accruals and low NTCR suggest that the information about firms who are bearing more risky profile with less usage of trade credit, is negatively translated in stock market and thus the famous notion of "high-risk high-return" does not validate for this particular portfolio.

Table 4.17: Regression results from Proposed Five-Factor Model

Dependent variable/ Sub-Portfolios	C	MKT	SMB	HML	ACC	NTCR	R^2
$R_{pt} - R_{ft} = \alpha_t + \beta_1(R_{mt} - R_{ft}) + \beta_2(SMB_t) + \beta_3(HML_t) + \beta_4(ACC_t) + \beta_5(NTC_t) + \mu_t$							
P	-.004	.097	-.016	.389***	-.488***	.746***	.284
S	-.001	.078	.339***	.15	-.657***	1.032***	.379
B	-.006	.084	-.497***	.346***	-.431***	.737***	.430
S/L	-.003	.065	.367***	-.085	-.443***	.747***	.303
S/H	-.003	.047	.613***	.931***	-.593***	.856***	.555
B/L	-.006	.07	-.292***	.058	-.397***	.514***	.315
B/H	-.007	.091	-.459***	1.014***	-.088	.357**	.339
S/L/LAC	-.005	.095	.453***	-.032	.28*	.537***	.204
S/L/HAC	-.008	.062	.351***	-.021	-.874***	.586***	.298
S/H/LAC	-.007	.087	.678***	1.116***	.106	.471***	.528
S/H/HAC	-.005	.05	.725***	.947***	-.899***	.715***	.536
B/L/LAC	-.003	.03	-.32***	.067	-.061	.551***	.229
B/L/HAC	-.008	.102	-.284***	-.029	-.746***	.573***	.402
B/H/LAC	-.004	.071	-.589***	.622***	.179	.825***	.287
B/H/HAC	-.004	.074	-.624***	.966***	-.947***	.65***	.493
S/L/LAC/LNTC	-.002	-.021	.516***	-.321*	.149	.424**	.137
S/L/LAC/HNTC	-.009	.228**	.355**	.107	.396**	.601***	.185
S/L/HAC/LNTC	-.001	.152	.455**	-.402*	-.745***	-.111	.111
S/L/HAC/HNTC	-.003	-.029	.46***	.017	-1.089***	1.496***	.145
S/H/LAC/LNTC	-.012	.239**	.715***	1.432***	.365*	-.714***	.610
S/H/LAC/HNTC	-.005	-.06	.66***	.887***	-.038	1.568***	.466
S/H/HAC/LNTC	-.008	-.049	.749***	.813***	-1.021***	.025	.363
S/H/HAC/HNTC	-.003	.147	.769***	1.118***	-.72***	.938***	.506
B/L/LAC/LNTC	-.001	.064	-.271**	.128	-.132	.403***	.118
B/L/LAC/HNTC	-.006	.02	-.397***	.003	-.016	.725***	.265
B/L/HAC/LNTC	-.008	.011	-.367***	-.199	-.941***	.601***	.391
B/L/HAC/HNTC	-.007	.166*	-.23*	.105	-.636***	.612***	.307
B/H/LAC/LNTC	-.006	.076	-.396***	.63***	.31*	.037	.173
B/H/LAC/HNTC	-.001	.043	-.759***	.796***	.004	1.606***	.381
B/H/HAC/LNTC	-.002	.112	-.915***	1.517***	-1***	-.054	.485
B/H/HAC/HNTC	-.006	.064	-.388***	.589***	-.887***	1.043***	.404

Note: Here P represents portfolio of all sample firms in sample period. S and B represent size i.e. small and big. L and H are Low book to market ratio and High book-to-market ratio respectively. HAC and LAC indicate sorting on the basis of high accruals ratio and low accruals ratio. LNTC and HNTC are the low neutralized trade credit ratio and high neutralized trade credit. MKT is market return in excess of Rfr, SMB is small minus big, HML is high minus low, ACC is LAC-HAC and NTC is HNTC-LNTC.

4.4.8 Two-Pass Regression Results from Proposed Five-Factor Model

Results for the Fama Macbeth four-factor model are reported in Table 4.18. For the two-pass regression methodology, time series linear regression is applied for estimating rolling betas which are then used for estimating cross-sectional betas. These estimated

betas are then used for estimating the relationship of market, size factor, value factor and performance factor with average stock returns of the portfolios that are sorted on the basis of size(small, big), book to market ratio (high low), Accruals (low high) and NTCR (low high).

Table 4.18: Two-pass Regression results from Proposed Five-Factor Model

Dependent variable/ Sub-Portfolios	C	MKT	SMB	HML	ACC	NTCR	R^2
$(R_{pt} - RFR) = \alpha_t + \gamma_{MKT,t}\hat{\beta}_{MKT} + \gamma_{SMB,t}\hat{\beta}_{SMB} + \gamma_{HML,t}\hat{\beta}_{HML} + \gamma_{ACC,t}\hat{\beta}_{ACC} + \gamma_{NTCR,t}\hat{\beta}_{NTCR} + \varepsilon_{i,t}$							
P	.0082	-.225**	.0882	.0199	-.0417	.0387	.0752
S	-.0641	-.2725**	.1133	.0261	-.011	.0994**	.0679
B	.01906	-.03541	.024586	.035167	-.02651	-.04515	.0368
S/L	-.0399	.061639	.13448	.040865	.026156	.006965	.0502
S/H	-.08516	-.06711	.1035*	.05162	-.0345	-.03233	.0647
B/L	.01707	-.01115	.02614	.043865	.011505	-.02941	.0401
B/H	-.00127	-.17265	.04751	.030379	.00533	.007744	.0695
S/L/LAC	-.0964***	.1916*	.0834*	-.0759*	.0611**	.0890**	.1450
S/L/HAC	-.02178	.01211	.109098	.045516	.01177	-.0167	.0329
S/H/LAC	-.08226	-.02503	.0988*	.018607	-.01387	.001317	.0731
S/H/HAC	.05855	-.20886	.012789	-.05577	.018031	.003552	.1165
B/L/LAC	-.00869	-.12533	-.00423	-.00737	.016752	.041828	.0236
B/L/HAC	.02266	-.0179	.005833	.023244	.012474	-.02917	.0306
B/H/LAC	.003073	-.1147	-.00101	.026988	-.03449	.002446	.0219
B/H/HAC	.018374	-.20937	.105143	.059319	-.00496	.016145	.0916
S/L/LAC/LNTC	-.05132	-.0778	.0963	-.03973	-.00089	.011107	.0641
S/L/LAC/HNTC	-.04648	-.03052	.078734	.029193	.017388	.022938	.0317
S/L/HAC/LNTC	-.03565	.060127	.026204	-.01071	.002392	-.01518	.0238
S/L/HAC/HNTC	-.08352	-.09525	.002302	-.02261	-.00357	.06523	.0368
S/H/LAC/LNTC	-.06223	-.00143	.104382	-.00288	-.0076	.023671	.0518
S/H/LAC/HNTC	.002511	-.01149	.047819	.017999	-.00783	-.03257	.0274
S/H/HAC/LNTC	.032522	-.19986	.003059	-.04212	.027874	-.04608	.0919
S/H/HAC/HNTC	.066707	-.13959	.072509	-.00913	-.02998	-.0782	.0921
B/L/LAC/LNTC	.0268**	-.07202	.000163	.0922**	-.04108	-.0834**	.0972
B/L/LAC/HNTC	.019409	-.15335	.093452	-.01878	.024642	.058666	.0434
B/L/HAC/LNTC	.02785	.114019	-.03426	-.0182	.0442**	-.0670*	.0542
B/L/HAC/HNTC	-.00728	-.01467	.0963***	-.0029	-.0872*	-.0230	.1068
B/H/LAC/LNTC	-.02313	.033239	-.05669	-.04342	.052851	.00063	.0458

B/H/LAC/HNTC	-.01437	-.09603	-.01423	.010131	-.01562	.00376	.0277
B/H/HAC/LNTC	.023793	-.27411	.063768	.050705	.035447	-.00721	.0975
B/H/HAC/HNTC	.0133	.106951	.061569	.038487	.005145	-.03253	.0645

Note: Here P represents portfolio of all sample firms in sample period. S and B represent size i.e. small and big. L and H are Low book to market ratio and High book-to-market ratio respectively. HAC and LAC indicate sorting on the basis of high accruals ratio and low accruals ratio. LNTC and HNTC are the low neutralized trade credit ratio and high neutralized trade credit. MKT is market return in excess of Rfr, SMB is small minus big, HML is high minus low, ACC is LAC-HAC and NTC is HNTC-LNTC.

According to the Fama Macbeth regression 4.18 table results, it is found that five-factor model is not helpful in determining the relationship of future stock returns with SMB, HML, ACC and NTCR for all sorted portfolios for the sample period in the context of Pakistan. Small firms with low book to market ratio and low accruals are providing little help in predicting future stock returns but low explanatory powers of this portfolio in particular and all portfolios in general, may doubt the failure of five-factor model.

Chapter V

5. Conclusion

The purpose of this study was to analyze various factors that motivate firms to extend trade credit to their customers. In particular, the objective was to analyze the financing motives which included helping hand motive and commercial motive; price discrimination motive, and advantage of controlling buyer. Further, this study compared trade credit to the short term bank loans for analyzing both choices of financing preferred by customers. Moreover, the consequences of trade credit extensions and their impact on the performance of the firm was also explored along with the macro-level impact of trade credit extension.

The findings of this study suggest that the Pakistani firms' value financing motives more and offer trade credit keeping in view the helping hand motive and commercial motive. The price discrimination motive and advantage of controlling buyer motive have not been 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 maintain long term business relationships. This study also found the evidence of strong credit relationship theory that firms supply trade credit more on the basis of their previous relationships.

The complementary association between trade credit demand and short term bank loans suggests that firms that can access short term loans easily also demand trade credit from suppliers. This implies that managers should focus on clear terms while taking loans

from banks as it increases their chance to get more trade credit and ultimately leads to more market share and enhanced sales. The results also indicate that listed manufacturing firms in Pakistan face no difficulty in obtaining trade credit financing to fund their business. This can be explained in the way that as listed companies' creditworthiness can be judged by their shares as they have a market value so they can easily access bank loans for trade financing facilities from financial institutions with minimal security. Moreover, it is also found that small firms rely more on trade credit and these credit relationships are dependent on the previous record of the customers.

For the purpose of finding the association between late payments from debtors and firm performance, with a supporting theory of "early collection improves profitability" (Deloof, 2003; Garcia-Teruel & Martinez-Solano, 2007; Teh, 2010), using DSO (Days sales outstanding) as a proxy to measure late payments, this study proves that DSO is not an appropriate proxy in the context of Pakistan. The reason may be because each industry has different DSO benchmarks hence the generalization of DSO is not proved in the context of the Pakistani manufacturing firms. Different proxies were also suggested by Teh, (2010) but the measurements were based on unique data set and lack of availability of disclosed information along with the reluctance of companies to share such information, the use of other proxies for measuring late payments remain unsuccessful in the context of Pakistan.

For the stock return predictability hypothesis, previous literature suggests that suppliers of trade credit have more information about its borrower than financial institutions while extending credit (Kallberg & Udell, 2003). In this study, we analyzed

that whether this information that is embedded in trade credit provides any positive signal about the borrower's future performance and whether this information content is translated into future stock returns or not in the context of the Pakistani equity markets. Using Fama & French models with our proposed 4 and 5 factors model along with Fama Macbeth regression, we found that net trade credit ratio significantly predicts future stock returns beyond the known predictors such as MKT, SMB, HML and ACC. From the two-pass regression of Fama Macbeth, it is found that the study could not explain the relationships between risk factors and future stock returns as the coefficients of past beta factors are almost insignificant for all portfolios. The values of R -square are very low and the p-values are insignificant for all portfolios, indicating that past beta factors are not explaining future return.

5.1 Policy Implications:

The motivation behind this research was to explore the issues related to trade credit management in the context of Pakistani manufacturing firms. Although, literature on capital market and economy of Pakistan is accessible, however few researches are available on trade credit management despite its significant role in terms of financing. This study has examined the issues that are relevant to the managers, business owners, and debt holders and the findings of this study may facilitate further research in similar areas of managerial finance. 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 to match their payables with receivables and these credit relationships are dependent on the

previous record of the customers. Moreover, it is proved that trade credit policies of firms are dynamic in nature, as these policies can be adjusted over time for the achievement of optimal level of trade credit and while adjusting trade credit policies, managers should re-visit their past relationship history of trade credit with their clients. 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.

From stock returns analysis, it is found that size premium, value premium, performance premium, and information premium are priced by the market. So, these factors must be considered during assets pricing. Investors must incorporate these factors in taking investment decision. The results of this study warrant all type of investors, fund managers, and analysts to include performance premium and information premium along with market premium, size and value premium for valuation purpose.

5.2 Future Research Directions:

For future analysis, trade credit supply may also be included to confirm this substitution hypothesis. Further, the inclusion of loan characteristics and customer characteristics can make this study more helpful for policymakers but a difficulty in accessing this kind of data set restricted us to add these variables in our analysis. Moreover, 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 difficulty in accessing this kind of data set

constrained us to add these variables in our analysis. Macro-economic variables like inflation or GDP may also be included to enhance the effectiveness of these relationships.

As the proxy used in this study failed to measure the collection period, it is further recommended to use different proxies using the internal sources of information as suggested by Teh, (2010) to derive meaningful results and implications that would help in improving the profitability of the companies. Moreover, it is also suggested that benchmark variations may also be controlled through industry dummy variables in a panel regression.

To test the cross-sectional variations in stock prices, asset pricing models have to be revisited using market-specific risk factors along with firm-specific risk factors for more rational justification of priced risk factors.

5.3 Limitations:

Although, the findings and results are contributing significantly to the literature of trade credit management in the context of the Pakistani manufacturing sector, but it unavoidably have some limitations. The focus of this study was mainly on the manufacturing sector and, thus, the findings and recommendations of this study may not be directly applicable to other sectors. In addition, the findings of this study may not be applicable to other sectors because manufacturing firms are having different characteristics and they usually hold high levels of inventories, allow more credit transactions, and generate more gross profits. Lastly, the sample period for the study was

from 2005 onwards as the previous data of reasonable number of the manufacturing firms was not available.

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