Impact of Trade Credits on Value and Profitability of Firms

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Firm value

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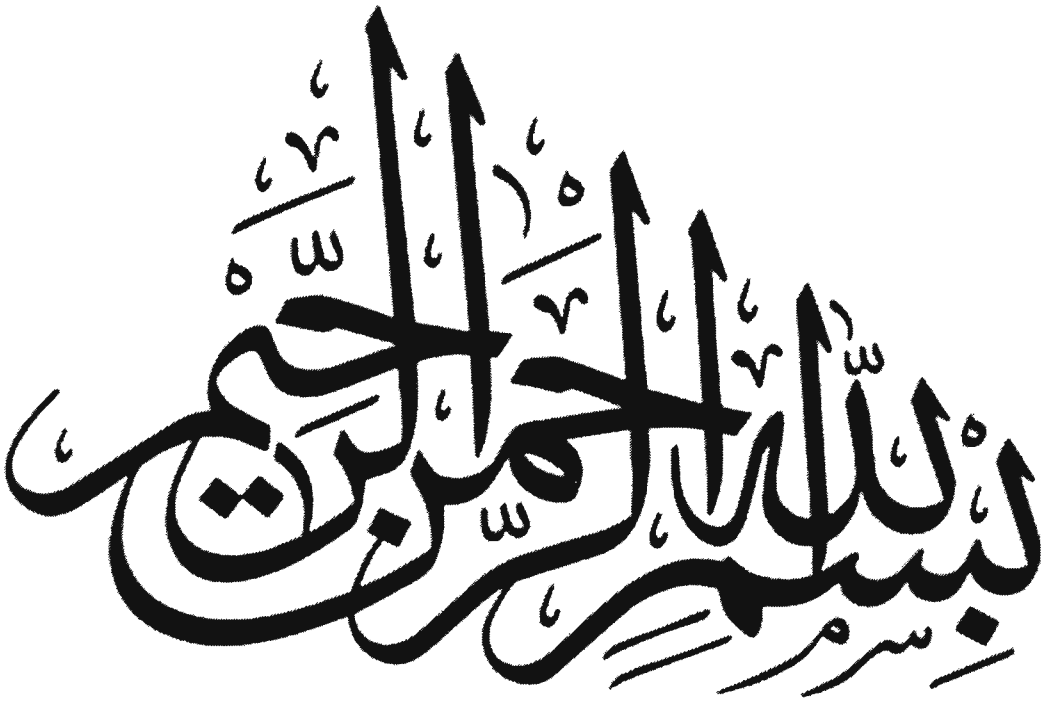
Firm profitability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Certificate

The thesis entitled "**Impact of Trade Credits on Value and Profitability of Firms**" submitted by **Ms. NailaQadir** in partial fulfillment of MS degree in Economics and Finance has been completed under my guidance and Supervision. It is certified that the student has incorporated the necessary changes suggested by the Examiners during viva voce exam on February07, 2017. Now the thesis is ready for further process.

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Dedication

This humble effort is dedicated to my beloved parents

Abdul Qadir

&

Zeenat Qadir

For their love, endless support, and encouragement

Declaration

I hereby solemnly declare that all the literature presented in following dissertation is entirely based on research work carried out in defense of my thesis topic. This publication is pioneer in its context and has neither similarity to any previously submitted thesis nor any copied material in its contents from any source except where due reference is clearly mentioned. All of the published data is result of my own efforts, research and analysis with support of those mentioned in acknowledgement, in specific my supervisor. If at some later stage plagiarism is detected in the submitted research based literature, I will be fully responsible for all the consequences as per the prevailing rules and law of approval committee.

Naila Qadir

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List of Abbreviations

LEV	Financial leverage
REC	Account receivables
ROA	Return on assets
V	Firm value
MBOOK	Market to book ratio
PSX	Pakistan Stock Exchange
OLS	Ordinary Least Square
GMM	Generalized Method of Moments
WCM	Working capital management

Abstract

This study examines the effect of receivables on profitability across large and small firms. In order to estimate our data and to mitigate the problem of endogeneity we applied the two-step system GMM estimator. We use balanced annual panel dataset covering the period 2000-2013.Our findings regarding effect of size integrated with receivables on profitability indicates that firms with large size earn more profits by providing receivables to sell the merchandise. This study also explores whether trade credit relates to firms' profitability strongly for more liquid firms as compared to less liquid firms. The findings suggest that managers can improve firm profitability by increasing their investment in receivables, and that effect is greater for more liquid firms.

This study also investigates the relation between firm value and trade credit. Considering the trade-off between benefits and costs of investing in trade credit, we estimate a non-linear relationship between accounts receivable and firm value. As expected, the results show the positive relation between firm value and trade credit at low levels of receivables and the negative one at high levels. Finally, we analyze whether deviation from target accounts receivable level reduces firm value. Consistent with the previous analysis, our results show that deviations from the target level of receivables decrease firm value.

Keywords: Trade credits; Account receivables; Credit receivables; Firm value; Firm profitability ; Generalized method of moments.

Chapter 1

Introduction

I. Background

Nowadays, trade credit is considered as an essential tool to enhance corporate firms' performance. Currently, it has become a significant component of working capital management in many developed countries. For business life of firms across the world, trade credit is considered a vital factor. The fundamental purpose of trade credit is to get profits. Trade credit has been defined by many researchers such as Lee et al. (1993) and Petersen and Rajan (1997). Most appropriate definition is given by Cunat (2007) and Garcia-Appendini and Montoriol-Garriga (2013). They defined trade credit as an agreement between a seller and buyer, which makes seller to allow buyer for making delayed payments for the purchased good rather cash payments. Martínez-Sola et al. (2013) and Ferrando and Mulier (2013) have defined trade credit as delay in payment to customers for delivery of goods by supplier. Thus, sellers do not require instant payment for delivery of goods. Trade credit can be of two types. First one is account payables known by trade credit demand. Payables are amounts a firm owes because firm has purchased goods or services on credit from a supplier. Other kind of credit is known as account receivables, are amounts a firm has a right to collect because firms have sold goods or services on credit to a customer. This is also named by trade credit supply.

Trade credit is a financial transaction where supplier firms deliver goods to their customers, they often do not require to be paid immediately. Instead, suppliers offer credit terms that allow the buyers to delay the payment (Lee et al., 1993). Trade credit provides a way path

for firms to finance externally. As it is a short-term loan, in balance sheet, it appears as the most important part in total liabilities and total assets (Boissay and Gropp, 2007; Lee et al., 2011). Moreover, investments in trade credits carry worthwhile opportunities for managers which can increase firms' profits (Stulz, 1990). No doubt, trade credit is very important issue of corporate finance. Nevertheless, trade credit has been given less attention in the literature of corporate finance. Furthermore, Box et al. (2016) reinforced the importance that management of trade credits carries highly importance not only for working capital policies but also in building strategies for corporates. In general, trade credit is measured by account receivables and account payables respectively. However, the focus of our study is only to relate trade credit (account receivables) with firm performance indicators such as profitability and firm value.

In recent years, researchers have put more emphasized on exploring the role of working capital management in short-term financing. They document that management of working capital is an essential part of financial management. Thus, each element of working capital should structurally and administratively be managed by distinct entities. Indeed, cash is managed by cash managers, receivables are managed by credit managers, and payables are managed by payable managers (Sartoris and Hill, 1981). Due to increasing corporate defaults, corporations have realized that not only liability management is important but also asset management carries equivalently importance. Firms invest their money and time for management of working capital. Trade credit is an important part of working capital (Long et al., 1993). However, when we review the empirical literature we observe that yet it is not given as such importance.

Trade credits play an important role in any economy as trade credits constitute substantial part of account receivables of non-financial firms (Ferrando and Mulier, 2013). For example, Mian and Smith (1992) pointed out that US non-financial companies hold 21% account receivables of book value of assets. Similarly, Kim and Sung (2016) stated that Korean manufacturing firms have 19% receivables of total assets. Moreover, reviewing the theoretical literature we find that many theories have presented reasons of extending trade credits and the specific conditions for non-financial firms granting trade credits to customers and how firms form terms and conditions for trade credit extension. Furthermore, much work has been done on the determinants of account receivables concerning to prospects and preferences of both suppliers and consumers (Deloof and Jegers, 1996; García-Teruel and Martínez-Solano, 2010; Kim and Sung, 2016; Love et al., 2007; Molina and Preve, 2009; Petersen and Rajan, 1997) . The influence of trade credits on firm' profits and value have also been considered theoretically by different researchers. For instance, Lewellen et al. (1980) demonstrated that firms' value and profits would be affected by trade credit decisions under imperfect condition in market. Before this, Stigler (1967) illustrated that financial decisions would not affect firms' value if perfect condition hold in the market. Nevertheless, perfect conditions practically do not hold in the market. However, scarce empirical literature is available on the significance of trade credit investment for earnings and profitability of firm. Example of these studies are Martínez-Sola et al. (2013), Martínez-Sola et al. (2014), Tang (2014), Box et al. (2016), and Kim and Sung (2016). A common findings emerging from these studies is that trade credits are important for determination of value and profitability of firms. One can expect that trade

credits increasing the level of investments in current assets, affect liquidity and performance of firms.

Furthermore, different authors have elaborated trade credits to achieve different motives defined by financial, marketing and transaction objectives. These objectives can be summarized as follows.

- Marketing Objectives: Trade credits can be used as a device to attain different marketing purposes, which are implemented on customers with various terms and conditions. According to Schwartz (1974), receivables are considered as "an integral part of firm's pricing policy". Nadiri (1969) has seen trade credit as "selling expense just like an advertisement". Petersen and Rajan (1997) have evaluated trade credits as convenient source to accumulate for business purposes from those firms, who are having excess of capital with the characteristics of liquidating assets efficiently. Supplier firms can be helpful in controlling and evaluation buyer's credit risk. Suppliers can allow price discrimination by using credits for the convenience of their buyers and to increase sales, implicitly protect equity stakes when financial conditions get unfavorable.
- Financial Objectives: Emery and Gary (1984) has demonstrated the financial motives of trade credits' supply when financial markets are found to be imperfect. As vendor firms will have as much as liquid asset, they may extend these liquid asset in the form of trade credits to customers at interest rate and rate of return increase. When firms do not have sufficient liquid asset they may borrow capital from financial intermediaries at high interest rate. Further, they extend this capital

to small sized firms relatively lower interest rates. Due to this discrimination, customers get financial incentive and firms get more rate of return. Schwartz (1974) has described that firms provide trade credits to customers to encourage growth of customers, promote the sales and expand the size of markets. Without any financial incentives customers cannot be attracted very easily by firms.

- Transaction cost: Trade credit is used as a tool to monitor and control the financial circumstances of buyers. On one side, trade credit financing not only helps firms to provide profitable transaction as a financial component, but also to guarantee goods' performance. When there is information asymmetry it means seller is having financial information which do not have with the buyers. Then buyer is at risk and transaction might be costly as they do not have sufficient information regarding product quality. During credit period buyers can examine the performance of products. The literature on this is extended by Smith (1987), Mian and Smith (1992), Long et al. (1993), Deloof and Jegers (1996), and Petersen and Rajan (1997).

1.1. Research Gap

Prior studies on trade credits left a significant space in the literature. Both theorists and empirics put emphasis on trade credit extensions and its determinants for developed countries. For example, Nadiri (1969), Petersen and Rajan (1997), Pike et al. (2005) provided evidence for the US, Cheng and Pike (2003) for the UK, Agostino et al. (2014) for the Italy, and Tang (2014) and Martínez-Sola et al. (2014) for the Spain. Less work has been done for developing countries. It should also be noted that in case of Pakistan, we did not find any empirical study examining the impact of trade credits on firms' value and

profitability. Further, we do not know how firms' value would be affected when they deviate from their target level of account receivables. This study contributes to the existing literature by analyzing the impact of trade credit investments on profitability and value of firm for a panel of Pakistani manufacturing firms.

When we review the literature on Pakistan we find that most of researchers have put effort to show the impact of working capital management on firms' performance. For instance, see Nazir and Afza (2009) and Raheman et al. (2010). But to my knowledge, still working capital components' impacts have not yet been analyzed for firm performance. Hence, our study presents evidence on the role of one of the main component trade credits' role on profitability and value of firms.

1.2. Research Objectives

The main objective of the study is to examine the role of trade credits in determining firms' profitability and value. Specifically, the focus of the study is to explore the relationship between credit receivables and the profitability and value of Pakistani manufacturing firms.

In particular, the study aims to achieve the following objectives.

a) To investigate the impact of trade credit financing on firms' value specifically, the study aims to explore whether firms gain financial advantage if they invest in receivables or excessive investments in credit receivables create losses.
b) To examine how the value of firms would be affected when they deviate from their target level of account receivables.

c) To analyze the credit receivables' impact on profitability. The study also examines whether the effect of credit on profitability differs across firm size.

d) To examine whether more liquid firms extend more trade credits to generate higher profits.

1.3. Research Questions

Given objectives of the study, the following questions are answered.

a) Do firm value and trade credits investment have non-monotonic relationship?

1) Does firm value increase at low level of trade credit investments?
2) Does firm value decrease at high level of trade credit investment?

b) Does the impact of trade credit financing on profitability differ across large and small firms?

c) Does more liquid firms generate high profits due to more supply of trade credits?

1.4. Research Hypotheses

H_1: Firm value and investment in trade credits (account receivables) are related non-monotonically. That is, firm value will be positive when trade credits are granted at low levels and at high level firm value will be negative.

H_2 : Profitability and trade credit investment are positively related for both small and large size of firms but strong effect for large firms as compared to small firms.

H_3 : Profitability increases with trade credit financing for more liquid firms.

1.5. Significance of the Study

The main aim behind this study is to present the trade credits as a key driver of firm performance. This study would be helpful for policy makers to set targets and design the effective policies. Furthermore, our study attempt to explore an approach to benefit management of firms in selection of better financial choices. In this way, this would be helpful to take effective decisions to extend sales on trade credits in order to enhance value and increase profits. The findings would be valuable for new scholars and additionally help as future reference for researchers and academics, examining the trade credit impacts and its financial motives on profitability and value of firms. Also, empirical evidence for different firm performance influences on trade credits aid to enrich our understandings concerned on this subject. In this way, our study would open an avenue for firms facing financial frictions, provides investment opportunities because sales on trade credits do not require instant cash payments and encourage delayed payments with acceptable terms and conditions. So, this study would be beneficial for small firms in availing better investment opportunities and opting the more profitable projects.

In Pakistan, previous studies have focused on the relationship between working capital management and firm performance. Our study differs from the previous studies of Pakistan because our study analyse the relation between trade credits (component of WCM) and firm performance. Therefore, our study also initiates to analyse the effects of working capital management' component (credit receivables) separately.

1.6. Dissertation Structure

The dissertation is structured into five chapters. Chapter 1 presents background, objectives of the dissertation, research questions that this study attempts to answer. We also identify literature gap. In this chapter, we present significance of study as well at the end of this chapter. Finally, we present structure of the thesis.

Chapter 2 reviews the theoretical studies relevant to the impact of trade credits on performance of firms. Precisely, this chapter illuminates the different financial and non-financial theories, explaining why firms extend trade credits.

Chapter 3 reviews the important literature and theories related to firm value and credit receivables. This chapter also presents comprehensively review of empirical studies that relates to profitability and trade credits.

Chapter 4 of this thesis presents the empirical models that we implement in this study to explore the impact of trade credits on firms' profitability and value. Chapter 4 also explains methodology (system GMM estimator) and data description is also given in this chapter.

The next chapter, Chapter 5 presents the empirical results. Firstly, this chapter gives summary statistics. Next, the results on the impact of trade credits' differential effects for size and liquidity on firms' profitability are presented. After that, the results on the relationship between credit receivables and firms' value are given. Finally, we present the evidence on whether deviation from trade credit target reduces value of firms.

Finally, Chapter 6 presents summary of the findings, policy recommendations, and some areas for future research.

Chapter 2

Trade Credit Theories

Prior trade credit theories provided explanations for the reasons of trade credit extension, why suppliers lend without defining the terms and conditions for input supply on trade credits. For example, Schwartz (1974) illustrated that credit constraints exist due to trade credit uses. Because, the purchasers facing credit constraints have enough potential to raise their input purchases. This possibility of obtaining more sales provide suppliers easy approach to capital market and also benefits to offer trade credits to their customers. The explanation by Schwartz (1974) losses focus in a broader setup of the model because it fails to determine the acceptance of credit term by seller and buyers. Also, the possibility of trade credit existence should be defined by several restrictions. Since, in current financial theories, modern models for credit receivable depend on the frictions to illustrate the trade credit existence. Hence, the presence of trade credit is justified by different specifications based on transaction costs, the existence of taxes, information asymmetries, imperfect market competition, and moral hazard problems.

2.1. Taxes: The presence of taxes incorporating market frictions provide most primitive explanation in order to motivate trade credits. Brick and Fung (1984) illustrated distinct tax regimes for the sellers and buyers, trade credit useful to safeguard from the maximum tax schedules. This is because, sellers must account taxable proceeds in fractions to the installments of received credit. This model demonstrates the flow of trade credit either from buyer to seller or seller to buyer rely on the handling of marginal tax rates between sellers and buyers.

2.2. Transaction Costs: Trade credit may also appear to lessen costs integral to cash management of firms. Transaction costs lead towards two major theories to induce trade credits. Initially, when firms face uncertainty regarding delivery of goods at certain time period. They anticipate trade credits determined by cash inflows and outflows (Ferris, 1981). Since, buyers predict about the timing for the occurrence of cash flows that eradicates liquidation requisites of asset or to get an overdraft facility. In this manner, costs can be reduced to acquire liquidity. Correspondingly, when a seller faces random cash inflows, he has incentives to achieve more likely course of cash and also adopt more suitable way of liquidity. Therefore, when firm face cash desires, trade credit can be considered as an effective mean to reduce liquidity management charges (related to insolvency or excess borrowings). Due to cash deficiency, firms allocate account receivables to get liquidity. In fact, trade credits are offered due to incentives to get high returns. Hence, trade credits preferred over loan commitments making investments in liquid profitable securities, getting liquidity through demand deposits due to incentives to attain high returns.

2.3. Imperfect Market Competition: Trade credit extension can also be discussed as a response to imperfect market competition. In product market, if there is no competition then pure cash-payment can be dominated by discriminatory trade credit offers. Brennan et al. (1988) asserted two alternative circumstances. According to initial circumstances, for inputs various buyers hold different reservation prices due to wealth considerations. Hence, clients are offered credits with low reservation prices. So that, suppliers increase profits by extending the sales. Second circumstances, credit quality of buyers vary. All buyers are offered similar credit terms, suppliers decrease the loan prices for low-credit

quality clients. Similarly, credit rationed buyers are more likely get credits from sellers. On the contrary, credit worthy buyers prefer cash payment because they find trade credits too costly. This makes able the suppliers to enhance sales, sales of trade credits better off rather than cash payment. In this context, trade credit is subsidized as a mean to discriminate prices in favor to low-quality buyers.

2.4. Information Asymmetries: Information asymmetry is another common friction among seller, buyer and outside investors. Information asymmetry has been considered one of the contemporary justification for trade credit existence. Further, we identify two major streams build up information asymmetries. The first considers, the product quality specified by both buyers and sellers. Because trade credit certifies the quality of product (Lee et al., 1993; Long et al., 1993). On the other hand, purchasing the product on credit determines the reliability and quality of goods by cause of the net period provided to the buyer (use the product to test the quality before making payment). If product do not achieve the buyer's requirement, buyer has option to return the product back and reject to pay. On the other hand, if buyer purchase the product on cash payment, has to bear product risk. Hence, recovery of payment or reclamation for payment may be costly.

Relatively in a different way, Smith (1987) also presents uncertainty in the product market to advance a further comprehensive trade credit theory. However, in this theory the critical factor is to introduce information asymmetries between lender and buyer. In fact, information asymmetry between lenders and buyers is the essential feature for the literature of asymmetric information. More specifically, Smith (1987) assumes asymmetries of information not only in product market as well as between lenders and buyers. Suppliers

offer various credit terms as an approach to screen among buyers with unlike default risks. Buyers select only those contracts that maximizes their profitability, taking into account bank loan prices, trade credit prices, also reduce the uncertainty for the quality of sold goods. In Smith's (1987) modified theory, credit terms also offer discount period, if firm take the advantage get the benefit. Furthermore, the firms give up discount options then late payment penalty incurs and firms have to pay high cost for trade credits. This reveals that buyers has no approach to get low-cost bank finance. Due to this reason, sellers are highly warned of default risks. For sellers, having considerable sunk cost investment with buyers, this default information will be helpful. Sellers collect information about buyers regarding the buyers' credit choices, such as, when the buyers should be monitored, whether credit terms required to be modified or not. Whether product supply should be ceased for risk customers.

2.5. Moral Hazard: Moral hazard occurs when one party will bear risk and other may take advantage of this risk due to information advantage. Mostly sellers bear the cost as for seller it is not possible to collect information of different buyers. In contrary for buyers, it is quite easy to get information of seller firms. Burkart and Ellingsen (2004) discuss that at screening, suppliers not necessary presumed to be better among various borrowers. Information advantage depends on the control over purchasers' actions, for instance moral hazard reduction. The supply of inputs may cause to provide information that permits sellers to control purchasers. Suppliers of input are also aware of the buyers that they are undertaking in useful activity. Banks avoid to lend cash to buyers because monitoring cost incurs due to cash diversion. On the contrary, Biais and Gollier (1997) demonstrate that suppliers may lend to firms (buyers) that would be declared as credit rationed by banks.

Chapter 3

Literature Review

This Chapter presents review of existing literatures. In Section 3.1, we have documented the studies regarding relationship of firm value with credit receivables. In Section 3.2, impact of credit receivables on profitability has been reviewed presenting current literature. Similarly, Sections 3.2.1, 3.2.2, and 3.2.3 present the studies for exploring the effects of leverage, size, and growth on profitability respectively.

3.1. Firm Value and Trade Credits

This subsection, offers a comprehensive review of the existing literature on the relationship between firm value and credit receivables and also between profitability and receivables. We also compare different strands of literature that precise the debate of firms' value influence on receivables by trading off between costs and benefits. In short, we have presented the literature showing the two different effects of trade receivables supply by trading-off the benefits and costs. Initially, with the help of previous literature, it has been argued that firms get gains supplying the credits to customers at specific level of credit receivables. When firms extend receivables excessively and level of receivables' investment get higher then costs exceeds the benefits and it effects negatively firm value. There are some studies in the existing literature that have examined the association between trade credits and the value of the firm. Lewellen et al. (1980) presented theoretical explanations for the impact of credit evaluation on firm value. Further, Hill et al. (2012) and Martínez-Sola et al. (2013) have demonstrated that firms' value and receivables are significantly related. Lewellen et al. (1980) expected non-monotonic relationships

between trade receivables and firm value. They developed a model assuming no effect of credit policies on firm value under market competition. When the authors relaxed the assumptions of market competitiveness and considered the presence of uncertainty, costs and defaults occurred in process of credit evaluation that influenced the firm value. Because under market imperfections, credit decisions and policies affect the firm value. Also they revealed that credit extension at certain level maximize the firm value. In addition, Hill et al. (2012) have examined shareholder wealth implications of providing credits for customer's financing. They used nonfinancial American firms' data for the period 1971-2006. They used OLS for estimation purpose. The results found to be significant for receivables extension by opting contracting and operating motives. They concluded that trade credit seems to be an effective tool alleviating resistances obstructing growth of sales. Therefore, through credit supply firms derive strategic benefits to increase firm value and provides linear relationship of firm value and investment in receivables. Likewise, Martínez-Sola et al. (2013) have studied trade credit and firm value relationship for Spanish firms for the period of 2001-2007 based on the trade-off between cost and benefits in investment of receivable credits. They used the two-step Generalized Method of Moments (GMM) for estimation. They provided evidence on the non-linear relationship among value of firm and trade credits.

The literature described some benefits provided to supplier firms by context of receivables extension. One can suppose that the motivations for credit extensions derived by some benefits. Examples of these benefits are mitigating of clients' financial frictions, lessening of transaction costs, reducing information asymmetries between seller and buyers, signaling the quality of products, and improving the relationship of customers and

suppliers. Therefore, Meltzer (1960) and Choi et al. (2005) explained the motivation of credit supply that was to mitigate financial limitations of clients during tighter monetary policies. Meltzer (1960) studied monetary policy influences on firms' behaviors regarding credit receivables' extension. The author argued that firms collect liquid balances when there is easy money period, the firms utilize these liquid balances to grant trade credits at the phase of tight money. For this purpose, data was taken for the time period from 1955 to 1957 of manufacturing firms considering different size groups. Moreover, tight money policies differentiated fundamentally against less liquid and smaller firms, because for large firms it was found quite easier access to non-bank funds. Hence, he concluded that credit receivables supply helps in mitigating customers' financial limitations during tight money. Choi et al. (2005) reinforced Meltzer findings by using disaggregated firm-level quarterly data for US over the time period 1975-1997 and estimating OLS regressions. The results supported the view that during tight monetary policy, interfirm financing promoted by surge in credit receivables. This inhibits the adverse effects of tighter monetary policy and become cause to lessen financial restrictions of customers by stimulating sales on receivable credits.

Further, Smith (1987), Long et al. (1993), Deloof and Jegers (1996), and Pike et al. (2005) provided explanations of information asymmetrical decline due to trade receivables investments. Smith (1987) presented theoretical model for credit terms in relation to information asymmetries. He found that credit terms determines an effective screening criteria, where sellers protect themselves by making non-salvageable investments, as they revealed information about buyers' default risk. Hence, the author concluded that sellers are warned about default risk of buyers to avoid losses. The information also revealed

whether credit must be extended to buyer to increase sales. Similarly, Long et al. (1993) further extended informational asymmetrical model for trade credit offerings pioneered by Smith (1987). Also, they provided empirical analysis to test the alternative theories using US manufacturing firms' sample data from COMPUSTAT for years 1984-1987. They applied univariate and multivariate tests. The results found to be consistent with theories of informational asymmetries that smaller firms (lack of reputation) produce high quality goods to fulfil the buyers' requirements. Therefore, smaller firms extend more credit receivables to stimulate sales and earn more. Deloof and Jegers (1996) presented empirical analysis based on the model proposed by Long et al. (1993) to explain whether trade credit extension purpose is to let the buyers assess the quality of firms' products before payment. They used sample data of Belgium firms for years 1989-1991 and applied the OLS (Ordinary Least Square) regressions. The results showed that product quality is one of the main factor for firms to extend trade credit to buyers and strengthen firms' trading relations. However, they also found that larger firms with recognized reputes about their quality products would offer less trade receivables compared to smaller firm. Pike et al. (2005) explored information asymmetrical evidences empirically regarding policies of trade credits. They used sample data of 700 companies for the UK, the USA, and Australia. The evidence found supports for theories of information asymmetries, sellers' reputation declares to the buyer in credit periods as they verify the product quality in this time span, that increase sales for seller firms.

Moreover, Lee et al. (1993), Emery et al. (1998), and Agostino et al. (2014) presented the incentive of credit extension to indicate regarding the quality of product. Lee et al. (1993) developed a model of sales practices in the intermediated product market to enlighten trade

credit roles with different terms. The results revealed that cash discount magnitude carries information regarding quality of products, because separating equilibrium exists. Further, the consequences for the dynamic forces of equilibrium are asymmetrical information about good's quality and risk-sharing aims of buyers and producers. Likely, Emery et al. (1998) offered theoretical explanations for payment terms'[1] choices under which firms selling their products. Also, they provided empirical implications to support theories. They found that sellers implement only those payment terms, where signaling of the quality of product is more preferred to repair specialization. And also, trade credit policy terms providing the sellers' favor to buyers by offering credit periods to accommodate their information acquisition procedure. Similarly, Agostino et al. (2014) empirically inspected for trade credit part to play as a signal for verification of goods' quality. They used data for Italian non-financial firms from 1998 to 2006. They used GMM technique for estimation and results were found to be significant.

Nadiri (1969), Brennan et al. (1988), Petersen and Rajan (1997) and Ng et al. (1999) associated receivables' extensions with price discrimination. Nadiri (1969) investigated how firms minimize costs in order to decide prices and quantities of trade credit by context of price discriminations. He used data on US manufacturing firms over the period 1945-1964 and applied OLS estimator for estimation purpose. He concluded that trade credit is a worthwhile tool for minimization of costs. Likely, Brennan et al. (1988) offered the model for vendor financing with terms. For sellers, it is optimal to grant credit receivables at higher rate of interests (complemented by cash discounts). However, purchasers would select the contracts of credit financing with reduced price discrimination. Similarly,

[1] Terms selected on the basis of signaling the product quality, as sellers yield various quality products and buyers demand anticipated quality products enforcing compliance with contract of sales.

Petersen and Rajan (1997) provided empirical evidence to test price discrimination theory. They used NSSBF[2] for small firms and compustat for large firms sample data from 1987-1993. They used simultaneous equation model for credit receivables. The results revealed that firms facing sales decline extend trade credits by giving discounts on prompt payment and high charges on late payments. Hence, trade credit found to be worthwhile instruments for price discrimination and high gross margins inclined to high receivables supported price discrimination theory. They also found that creditworthy firms extend more credits, firms carrying high profit margins also extend more credit receivables. Furthermore, Ng et al. (1999) studied empirically whether to sell goods on credit to customers or on cash payment, if credit is granted simple terms should be adopted or discount terms. They provided empirical evidences on the policies of trade credits for supplier firms using data on compustat 2538 firms. Hence, they applied different logit models for selecting the best policies and terms regarding trade credits, reinforced by product quality and information asymmetric theories. They found inconsistent results that seller firms change terms for price discrimination or discount.

Furthermore, Summers and Wilson (2003), Cheng and Pike (2003), Fisman and Raturi (2004), Cunat (2007) and Hermes et al. (2012) argued the credit receivables supply to initiate the long term customer-supplier relationship. Summers and Wilson (2003) developed model for lending, optimal pricing and renegotiation strategies in the context of customer and supplier firms' relationship for trade credit extensions. They found long-term relationship of firms with their customers induce to offer them concessions by renegotiation strategy. Likely, Cheng and Pike (2003) explored empirical support for the

[2] NSSBF stands for National Survey of Small Business Finance.

theories that why non-financial firms extend trade credits to clients. They used survey data of UK large companies. They found strong empirical support for customer's financial and operating benefits. And customers' relations placed as motives for credit terms. Fisman and Raturi (2004) also explored whether competition promote the firms to strengthen the relationship with their clients by the view of trade credit provision. They used five African firm-level sample data that are Ghana, Tanzania, Zimbabwe, Zambia, and Kenya from 1992 to 1995. They applied random and fixed effect estimator. They concluded that customer-supplier relationship depends on the satisfaction of customers by assessing the quality of product till payment. This reduce their insecurities regarding product quality that in turn engender customers' relationship with supplier firms. Likely, Cunat (2007) examined that firms have comparatively more advantage over banks in lending the customers enforcing the contracts, explored empirically testing the theoretical models for consequences of supplier and client relationship, He considered UK reatail, manufacturing, and wholesale firms for the period 1993 to 2002. He used fixed effects and GMM. The results showed that suppliers are considered as liquidity providers in the situation. When their clients face liquidity shocks and this helps to survive their relationship with customers. Likely, Hermes et al. (2012) declared trade credits as a switching barriers. For showing the empirical evidence, they used survey data of 276 Tanzanian rice retailers and wholesalers. For estimation of the empirical models, probit regression was used. They derived the conclusion that if buyers fail to acquire access to short-term loans then they decide to switch suppliers, but on the other hand, suppliers prefer those buyers, having mature business understanding with stable and long trading relationship.

By contrast, some scholars offered key caveats of over investments in credit receivables that leads to incur for example, management costs of credits. Hence, previous literature also supported the theories of monitoring costs, transaction and other costs in formulating policies of credit receivables. Therefore, Sartoris and Hill (1981) formulated model for policies using credit and extended conceptual idea given by Kim et al. (1978). They analyzed cash flow consequences implementing credit policies. They concluded that trade credit is intent with some negative effects, because suppliers would have to bear administrative costs such like monitoring and screening costs and default debts. Further, Klemperer (1987) also presented the model that explained customers survive in markets by facing extensive switching costs between different product brands in unsatisfactory conditions after using the product. The switching costs categorized in contracted costs, transaction costs and learning costs. Similarly, Jain (2001) addressed the explanations of lending credit receivables to buyers by non-financial firms. For that, they presented the model based on existing intermediation theories. The results found costly for banks to scrutinize revenues of buyers. In contrast, for buyers' business partners it is not costly to examine buyer's revenues due to information advantage. Hence, the monitoring costs either for limited firms or more firms entailing an adverse consequences. The results found to be consistent with theoretical and empirical evidences on bankruptcy costs.

Pike and Cheng (2001) presented empirical evidence on theories[3] of credit receivables and management strategies. The policy stress mainly placed on credit receivables' certifications, setting the limitations for extending receivables, reviewing the terms and

[3] Pike et al. (2001) specifically tested the theories of credit management policies presented by Mian and Smith (1992). Pike et al. (2001) explored the diversity in receivables' management policies among firms by viewing their contracts and intermediaries.

conditions, and monitoring the costs of credit receivables. They used UK firm level data consisting 800 firms and applied OLS regressions. The results found to be not consistent with prior theories of credit policies. For this, they provided justification, prolonged delays in payment might be cause of default risks. Moreover, delay in payments associated with characteristics that are customer's dissatisfaction by product quality, poor relationship between customer and firm, and poor financial situation. Likewise, Van Horen (2007) provided explanation for customers' market power possessions inclined to increase their asymmetric information as regards to product quality. The author explored that specifically risky firms sell products on credits for market power possessions. Firm-level data was conducted by using Central Asia and Eastern Europe. The results provided evidence that it is costly to sell products on credit receivables for financially constrained risky firms as late payments incur huge costs. Likely, Murfin and Njoroge (2015) studied for constrained smaller firms, lend credits to large group of investors. They selected data from compustat over the years 1985 to 2010 and categorized the buyers according to their investment grades. For empirical evidence, they applied fixed effect estimator. They found smaller firms face delay in payments by buyers because they have some hesitations regarding product quality. Also, smaller firms face financial frictions. Hence, these smaller supplier firms facing simultaneously product and financial market frictions extend trade credits that they find costly. Likely, Derrien et al. (2016) investigated underlying effects of information asymmetries on credit costs. Thus, US data taken between the years 1994-2008 and used probit regression estimation technique. The results stated that surge in information asymmetries significantly increase credit defaults due to delay in payments. Also, the

author mentioned that clients take time to assess the quality of products and in case if they are not satisfied then they prevent to make payments for delivered good

3.2. Profitability and Trade Credits

Tang (2014), Martínez-Sola et al. (2014), Kim and Sung (2016), and Box et al. (2016) found the positive relationship between profits and investment in trade credits. Similarly, Tang (2014) discovered the relationship of trade credit demand (account payable) and trade credit supply (account receivables) with profits of firm. For this purpose, he used data of Netherland comprising of 71 small medium enterprises. The dataset taken for the period from 2009 to 2013. The results recommended negative but insignificant relationship between receivables and profitability, because of rise in default debts, monitoring and screening costs and administrative costs and reduction of the operational costs. Moreover, Martínez-Sola et al. (2014) examined profitability granting trade credits for operational, financial and commercial objectives. They used Spanish non-financial firms for period of 2000 to 2007. For estimation, they used fixed effect and two-step GMM to gain empirical results. The results suggested that for large and more liquid firms extending more sales on receivables increase profitability.

Kim and Sung (2016) explored the financial features of the trade credit determined by different variable such like size, growth, age along with profits. He applied panel regression for data of Korean firms during the time period 1992-2011. The conclusion inferred, larger size of older firms earn high profits in the spirit of trade credit extensions. In the same way, Box et al. (2016) studied effects of operating performance with strategic trade credit issuance by applying OLS and two-step system GMM estimation techniques. They

revealed a significant and positive relationship among performance and extension of trade credits for large firms.

Molina and Preve (2009) and Molina and Preve (2012) elaborated the consequences of financial crisis on firms' performance. Molina and Preve (2009) studied the financial distressed firms by the view of trade receivables, also analyzed whether financial distress put any effects on firm trade receivables' decision. They used firm-level US sample data for 1980-2000. They estimated the data using fixed effects. The results showed that in financial distress[4], firms reduce investments in trade receivables. Moreover, firms' performance also decline due to policies of trade receivables. This may cause to reduce firms' sales and profits. Molina and Preve (2012) inspected the effects of financial distress on firms' credit receivables. They used US companies for the time period 1978-2000 and applied panel data methods fixed effect estimator and pooled OLS. The evidence suggested that smaller firms in financial distressed conditions prefer to use more trade credits which effects adversely their performance.

In contrast, Kestens et al. (2012), Garcia-Appendini and Montoriol-Garriga (2013), and Carbo -Valverde et al. (2016) discussed the positive aspect of extending credit receivables in financial disaster with performance. Kestens et al. (2012) examined whether any impact of financial crisis hold on firms' trade receivables, also whether changes in trade receivables' extensions help to mitigate the effects of crisis on firm performance. They used data for listed and unlisted Belgium companies from 2006 to 2009, applied fixed effect estimation methods. The results presented the firms having access to short-term debts

[4] Financial distress is addressed to tight monetary conditions and also for high inflations.

by financial institutions offer trade receivables to their clients in order to mitigate their financial restrictions. Hence, this helped to reduce the negative effects of crisis on firm performance increasing receivables in crisis period. Similarly, Garcia-Appendini and Montoriol-Garriga (2013) explored the firms' liquidity provision during crisis period in form of credit receivables. The sample data used consisting of US non-financial firms taken quarterly from 2005 to 2010. Moreover, for estimation they used fixed effects. The findings suggested that non-financial constrained firms with increased liquidity levels offer more credit receivables during period of financial distress. This in turn, improved firms' performance. Likewise, Carbo -Valverde et al. (2016) analyzed importance of trade credit financing during crisis period. They considered Spanish firm-level data from years 1994 to 2010 and applied GMM first difference. The results provided significant evidence for credit constrained firms, because these firms reliance intensity increased on trade credits during the crisis that improved firms' performance. In contrast, unconstrained firms dependence noticed on bank loans.

3.2.1. Leverage and Profitability

Jensen (1986), Myers (1977), and Harris and Raviv (1990) presented trade-off theory to show positive association between leverage and profitability. They recommended that firm select optimal leverage ratio on the basis of corresponding the benefits of tax shields through debt compared to the costs (financial distress and bankruptcy) related with high level of debts. To support the trade-off theory, Abor and Joshua (2005), Gill et al. (2011), Margaritis and Psillaki (2010), and Baum et al. (2006) presented empirical evidences.

Abor and Joshua (2005) investigated the impact of leverage on profitability for Ghanaian firms listed at Ghana Stock Exchange for duration of 1998 to 2002. For empirical analysis, he used Ordinary Least Squares (OLS) technique. The results revealed significant positive relationship for leverage and profitability implying higher the debt, higher the earnings. Likely the former study, Gill et al. (2011) followed the Abor's (2005) research work. They examined empirically the effect of leverage on firm performance by using American manufacturing firms listed on New York Stock Exchange (NYSE) for the data, consisting of the time period from 2005 to 2007. The findings showed positive relationship between ratio of debt to book asset and return on asset. Likewise, Margaritis and Psillaki (2010) used the sample data of French manufacturing firms aiming to study the association between debt and firm profitability. They documented the positive link of debt on firm profitability. Baum et al. (2006) examined also the leverage and profitability relationship and provided comparison between US and German firms. The author concluded that German firms more depend on short-term liabilities to earn more profits.

On the contrary, Myers (1984) postulated the Pecking order theory that due to asymmetric information, financing costs escalates as investors think that due to overvaluation managers issue equities. Internal funds, equity, and debts are the sources of financing. Firms prefer preliminary source internal funds, in case of insufficient internal funds firm managers prefer debts and equity is issued if market overvalue it.Shubita and Alsawalhah (2012) followed Margaritis and Psillaki (2010) findings for the impact of leverage on profitability. The authors examined the relation of capital structure with profitability for industrial Jordanian Companies listed on Amman Stock Exchange from 2004 to 2009. They applied multiple regression and correlation. The results revealed that there is a negative significant

relationship between leverage and profitability. Habib et al., (2016) investigated the interaction between leverage and returns on asset. They used non-financial firms of Pakistan for time span of 2003-2012 by applying hausman test. The results suggested the negative relationship between debt to assets ratio and return on assets.

3.2.2. Size and Profitability

Lee and Jim (2009) examined the determinants of profitability more precisely, the importance of firm size in generating the profits. He applied fixed effect for panel data of US 7,000 public firms from 1987 to 2006. The results suggested that firm size positively relates to profits.

Jónsson (2008) investigated the effect of size on firm profitability. The author analyzed for firm-level data of Iceland through the period 2000-2004 by using three sectors mainly, 1) fish and fish processing firms, 2) Banks, 3) consulting firms for civil engineering. According to the results, negative relationship observed between profits and size for fish processing firms. In contrast, for banks is positive but weak association is documented. Several other scholars like Voulgaris et al. (2000), Papadogonas (2006), Agiomirgianakis et al. (2006), Jónsson (2008), and Dogan (2013) have also reported the positive link between size and performance. On the other side some scholars including Shepherd (1972), J. Goddard et al. (2005), Artikis et al. (2009), and Becker-Blease et al. (2010) have reported the negative relationship between size and performance.

3.2.3. Growth and Profitability

Coban (2014) investigated whether sales growth has any interaction with profitability of firms or not. In order to explore this relationship, the author used panel data for 137

manufacturing firms of turkey during the period 1997 to 2012. He estimated profitability and sales growth regressions by applying system-GMM. Accordingly, the results appeared to be positive for relationship of growth on profits.

Likewise, another study by Nakano et al. (2011) also aimed to explore the impact of firm growth on profits. Therefore, he used sample data for manufacturing Japanese firms over the time period of 1987-2007. The results confirmed the positive and significant interaction between growth and firm profits. Correspondingly, Lee et al. (2011) inspected for relationship among profitability and growth by using panel data for Korean firms. He applied not only fixed effects but also GMM as an estimation techniques for regression. The results suggested positive effect of growth on profitability. Artikis et al. (2009) analyzed the growth as an essential determinant of profitability for non-financial firms of Greek listed on Athens Stock Exchange over the duration 1995-2003 by using panel data estimation methodology. They concluded that sales growth positively relates to profitability. Roper (1999) and Gschwandtner (2005) found negative relationship between ROA and GROWTH. On the other hand, Coad (2007), Artikis et al. (2009) , Carvalho et al. (2013), Tang (2014), and Martinez-Sola et al (2014) found a positive relationship between profitability and growth.

In sum, the review of the aforementioned literature indicates that the exploration for optimal receivables level that maximizes firm value is not hitherto conclusive. The trade-off theory suggests that firms have optimal value that they define by trading off the costs in contradiction of benefits of trade receivables' supply. Most of studies have concluded that credit receivables have a vital role to play in firm financing placed as external

financing. Firms finance in receivables up to the level till firm value is maximized. Particularly, when the firms rely on receivables excessively then costs of firm exceeds the benefits. Hence, trade off theory presumes positive relationship between value and credit receivables when firms make financing in credit receivables that optimize its value. Hence, the benefits exceeds the costs.

We observe that above-mentioned studies have investigated the impact of credit receivables on firm performance in context of developed countries. Yet, we did not find any study conducted in Pakistan that investigates the relationship between trade credit and firm performance. Further, none of the study has analysed the differential effects of liquidity and size for extending credit receivables on firm profitability. Further, for the better understanding of differential effects of liquidity and size on firm performance, we take dummy of variables size and liquidity as interaction terms. Furthermore, we also observed that no study exists in case of Pakistan that analyse the non-linear association of credit receivables with firm value. When we confirm the concave shaped relation between receivables and firm value. We also investigate the impact of receivables' deviation from target level on firm value.

Chapter 4

Empirical Framework

In this chapter, our study aims to present the empirical models for estimation purpose. This chapter is divided into five Sections. In first Section 4.1, we present the profitability model. This model is used to show the size and liquidity effects respectively for credit receivables' supply on firm profitability. In Section 4.2, we present the value model to examine the non-monotonic relationship between firm value and credit receivables. In Subsection 4.2.1, we examine the impact on firm value of the deviation from the target account receivables. Therefore, we augment the value model to estimate the effects of deviation from target level of receivables on value and control variables remained same. Further, in Section 4.4 and Section 4.5 respectively, we have described methodology and data.

4.1. Profitability and Trade credits

One of the central objectives of this study is to analyze the effect of credit receivables on profitability that varies for firm's size and liquidity. So, we have included firm-specific variables to see their impact on profitability. These include receivables REC_{it}, dummy size interacted to receivables $D_{it}^{SIZE} \times REC_{it}$, dummy liquidity integrated with receivables $D_{it}^{LIQ} \times REC_{it}$, firm size $SIZE_{it}$, firm growth $GROWTH_{it}$, and leverage LEV_{it}. We present these variables in Table 4.1 along with their expected impacts on firm profitability. We have also described their measures.

Table 4.1: Variables' Definitions of Profitability Model

Variable Name	Expected Signs	Definition
Dependent Variable:		
Profitability (ROA_{it})		Earnings before taxes and interest over total assets
Independent Variables		
Focused variables:		
Receivables (REC_{it})	+ve	Credit receivables divided by total assets
Dummy size interacted to Receivables ($D_{it}^{SIZE} \times REC_{it}$)	-ve	Dummy size assigned 1 for small firms if firm total assets are lower than or equal to median of all firms assets and zero Otherwise. (size measured by natural logarithm of total assets).
Dummy liquidity interaction term of Receivables ($D_{it}^{LIQ} \times REC_{it}$)	-ve	Dummy liquidity assigned 1 for less liquid firms if firm total liquidity are lower than or equal to median of all firms' liquidity and zero Otherwise.
Control Variables:		
Firm size ($SIZE_{it}$)	+ve/-ve	Natural logarithm of total assets
Firm leverage (LEV_{it})	+ve/-ve	Total debt to total assets
Firm growth ($GROWTH_{it}$)	+ve	Log value of first lag difference of total annual sales.

In this subsection, our study initiates to examine whether the association between credit receivables and profits is stronger for larger firms as compared to smaller ones. Besides, we inspect whether credit receivables affiliates the firms' profitability strongly for more liquid firms as compared to less liquid firms. Hence, to achieve aforesaid aims of this study we formulate the below mentioned model to support the notion. This model relates the profitability to credit receivables integrating interaction term between receivables and dummy variables measured by size and liquidity correspondingly. We employ dummy variables (size and liquidity), elaborating the financial motives on profitability of firms. For this purpose, we formulate the below given model that enables us to examine the above-mentioned objectives of study.

$$ROA_{it} = \beta_o + (\beta_1 + \beta_2 Dummy_{it}) \times REC_{it} + \beta_3 Dummy_{it} + \beta_4 SIZE_{it} + \beta_5 GROWTH_{it} + \beta_6 LEV_{it} + \eta_i + \lambda_t + \varepsilon_{it} \quad \text{eq (1)}$$

In equation (1), ROA_{it} is the dependent variable used as a proxy for profitability, i represents firm and t shows the corresponding time period (years), β_o is the constant term, β_1 and β_2 are the main coefficients of the study showing relationship of independent variables with the dependent variable. Further, β_3- β_6 are the remaining coefficients present the impact of control variables on dependent variables. Further, η_i is used for unobservable heterogeneity and λ_t is included in the model as dummy variables of years, and ε_{it} is used for error terms.

The dependent variable ROA_{it} is defined as the ratio of earnings before interest and taxes to book value of assets (Titman and Wessels, 1988). The ROA_{it} (Return on Assets) aims

to measure the profit of per unit cash of total asset. The REC_{it} is key independent variable and is calculated by account receivables divided by book value of assets. This formula of receivables is in line with Deloof and Jegers (1996), and Boissay and Gropp (2007).

Next, our study aims to analyze whether large firms strongly effects the profits with respect to receivables' financing or small firms so, D_{it}^{SIZE} is dummy variable used for firm size. The size dummy enables us to make comparison between large and small sized firms in perspective of receivables' extension. Therefore, we consider firms on the basis of their size. In particular, we assign D_{it}^{SIZE} value 0 for large sized firms if the firms' assets are greater than the median value of the assets of all firms. On the other hand, D_{it}^{SIZE} takes value 1 for small firms if the firms' assets are less than or equal to the median value of firm assets in the sample.

Furthermore, interaction term is added to analyze the response of profitability to credit receivables' extension for differential effects of large and small firms. We also analyze whether strong effect lies for large firms or small ones. Hence, we interact dummy size D_{it}^{SIZE} with key independent variable REC_{it} .i.e. $D_{it}^{SIZE} \times REC_{it}$. This enables us to see the effect of receivables on profitability across large and small firms. For large firms, we consider $D_{it}^{SIZE} = 0$ then we get the interaction term $\beta_2 D_{it}^{SIZE} \times REC_{it}$ become zero.

$$ROA_{it} = \beta_1 REC_{it} + \beta_2 D_{it}^{SIZE} \times REC_{it}$$

$$ROA_{it} = \beta_1 REC_{it} + \beta_2 (0) \times REC_{it}$$

$$ROA_{it} = \beta_1 REC_{it} + 0$$

Here only β_1 shows the effects of receivables on profitability.

Similarly, for small firms we take D_{it}^{SIZE} equals to one then we get

$$ROA_{it} = (\beta_1 + \beta_2(1)) \times REC_{it}$$

$$ROA_{it} = (\beta_1 + \beta_2) \times REC_{it}$$

This approach is also applied in different studies for example, Dittmar and Mahrt-Smith (2007), Luo (2011), and Martínez-Sola et al. (2013) also presented grouping of large and small firms based on the median value of firm size. Some studies have documented the positive effect of receivables on profits of firm with respect to size i.e. Carvalho et al. (2013), Martínez-Sola et al. (2013), and Tang (2014). Moreover, we also incorporate some other firm-specific variables in our analysis which also affects the profitability of firms. These variables include firm size $SIZE_{it}$, sales growth $GROWTH_{it}$, and firm leverage LEV_{it}.

$SIZE_{it}$ is taken as natural logarithm of total assets (Deloof, 2003). As a variable firm size is a major factor in determining the profitability and value of firm. If firms struggle to increase profits then they have to expand business and firms become large (Glancey, 1998). Rajan and Zingales (1995) justified the importance of firm size for profitability that large sized firms are more diversified and face low risk as compared to small sized firms. Large firms also face lower bankruptcy costs. Firms management also plays an important role. Bartel (1992) indicated that managers increase productivity of firms, for this they motivate employees to perform well. When their Job performance increases then firms' profitability enhances.

The next contrl variable sales growth $GROWTH_{it}$ shows growth opportunities for i^{th} firm in t years. We have calculated for annual growth of sales $GROWTH_{it}$ subtracting the previous year sales from current year sales and divided by previous year sales ($sales_t - sales_{t-1}/sales_{t-1}$). This measure is also used by Goddard et al. (2004), and Coad (2007). Sales growth helps in assessing the financial performance of any firm. The managers diversify the organizations by adopting innovative and competitive strategies, these advantages increase firm sales' growth which maximize their profits (Soininen et al., 2012).

Next, the last control variable financial leverage LEV_{it} is defined as book value of debt to book value of assets (Dogan, 2013). Kartikasari and Merianti (2016) reported that financial leverage has ambiguous impact on firm profitability. Although, the positive relationship between financial leverage and firm profitability are promoted according to agency cost theory. However, if firms' increase the debt ratio then agency cost theory fails, because firm's debt increases, default risk and interest rate get higher and debt become costly, in turn profitability gets lower (Shubita and Alsawalhah, 2012). This negative relationship between leverage and profitability promotes the pecking order theory.

Next, our study also aims to analyze the effect of liquidity in establishing the relationship between receivables and profitability. To examine this effect we use the dummy of liquidity and divide the firms by assigning 0 to more liquid firms and 1 to less liquid firms. We assign one to D_{it}^{LIQ} if firm liquidity less than or equal to median liquidity of all firms in the sample. In the similar way, D_{it}^{LIQ} is allocated zero if firm liquidity is greater than median liquidity value.

We re-estimate the profitability model presented in equation (1) by adding interaction term liquidity dummy with key independent variable receivables i.e. $REC_{it} \times D_{it}^{LIQ}$. The interaction term receivables × dummy of liquidity will tell us the impact of receivables' extension when linked with liquidity on the level of profitability. This term helps us to examine the differential effect of liquidity for receivables on profitability of firms. So, when we consider D_{it}^{LIQ} equals to zero for more liquid firms then we get

$$ROA_{it} = (\beta_1 + \beta_2(0)) \times REC_{it}$$

$$ROA_{it} = \beta_1 \times REC_{it}$$

Here we obtain zero for the whole interacted variable. Similarly, we take D_{it}^{LIQ} equals to one for less liquid firms. Therefore, we get $(\beta_1 + \beta_2(1)) \times REC_{it}$ for more liquid firms.

4.2. Firm Value and Trade Credits

In this Section 4.2, our objective is to determine the non-monotonic relation between firms' value and credit receivables. This non-monotonic relationship determine the desired level of investing the receivables that maximize the firm value. Next, we also examine the effect of over-underinvestment in credit receivables on firm value. First we show the measures of firms' value which are Tobin's q and market to book ratio. Then, we present the independent and control variables of value model in Table 4.2. The variables are receivablesREC_{it}, squared receivables REC_{it}^2, deviations DEV_{it}, firm size $SIZE_{it}$, firm growth $GROWTH_{it}$ and leverage LEV_{it}. We have also shown their measures and their expected relationships with firm value.

Now, in order to check the non-monotonic relationship of trade credits with firm value. We explore the non-monotonic effects of receivables extension on firm value by adding squared receivables in the model specification formulated as follows:

$$V_{it} = \beta_0 + \beta_1 REC_{it} + \beta_2 REC_{it}^2 + \beta_3 GROWTH_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \eta_{it} + \lambda_t + \varepsilon_{it} \qquad \text{eq (2)}$$

We have followed Martínez-Sola et al. (2013) as a predecessor for the above-mentioned empirical value model equation (2). In above given value model firm value variable is regressed on the key independent variable account receivables and its square along with control variables represented by $GROWTH_{it}$, $SIZE_{it}$, and LEV_{it}. We explore the non-monotonic effect of receivable investments on value of firm by adding squared receivables in the model specification formulated as above. REC_{it} , and REC_{it}^2 are used to test the benefit and cost of investment in account receivables respectively. The coefficient REC_{it} shows investment in credit receivables increase the firm value up to the break point. Whereas REC_{it}^2 indicates that excessive investment in receivables decline the value of firm after the break point and can create losses for firms (Martínez-Sola et al., 2013).

Table 4.2: Variables' Definitions of Value Model

	Expected Signs	Definition
Dependent Variable:		
Firm Value (V_{it})		Tobin's q: Market value of equity plus book value of asset minus book value of equity divided by book value of asset. MBOOK: Ratio of equity market value to equity book value
Independent Variables		
Focused variables:		
Receivables (REC_1 , REC_2)	+ve	REC_1: Ratio of Credit receivables to total sales. REC_2: Credit receivables over total assets.
Receivables Square (REC_1^2, REC_2^2)	-ve	REC_1^2: Square of REC_1 REC_2^2: Square of REC_2
Deviations (DEV_{it})	-ve	Deviation from target receivables' investment level
Control Variables:		
Firm size ($SIZE_{it}$)	+ve/-ve	Natural log of total assets.
Firm leverage (LEV_{it})	+ve/-ve	Ratio of total debt to total assets.
Firm growth ($GROWTH_{it}$)	+ve	Log value of first lag difference of total annual sales.

Next, the dependent variable V_{it} *is* denoted for value of i^{th} firm at t year. We use two measures for firm value. Hence, above mentioned equation (2), we estimate once for Tobin's Q and then we re-estimate the regression equation for market to book ratio. In financial literature, Tobin's Q not only measures the firm value but also used for growth measure. Therefore, Tong (2008), and Gaio and Raposo (2011) have formulated Tobin's Q by market value of equity plus book value of asset minus book value of equity divided by book value of asset. Market value of equity is calculated by number of shares outstanding times firms' stock market prices. Another proxy is used for valuation of firms is the market to book ratio ($MBOOK$), which also check robustness of results. $MBOOK$ is calculated by ratio of equity market value to equity book value in line with Lins (2003).

REC_{it} represents account receivables of i^{th} firm at t time period and REC_1 is calculated by fraction of account receivables to total sales (Cunat, 2007). REC_2 is defined by ratio of receivables to total assets, this definition is consistent with Deloof and Jegers (1999), and Martínez-Sola et al. (2014). In this model, we use two proxies for trade credits to allow us non-linearities for testing explicitly benefits of investing in receivables and cost of overinvesting in receivables. Further control variables $SIZE_{it}$, LEV_{it} (leverage), and $GROWTH_{it}$ measures are already discussed in previous Section 4.1, here we provide the discussion for each variable.

The variable size is an important measure to evaluate firm value. Large sized firms support advancements and innovations. Large firms enhances their ability due to possession of more resources. Firms get competitive advantage and that increases the firm value. Amato

et al. (1985) conducted the study that firm value might be influenced negatively by size factor due to poor decisions by management. They provided the reason that managers of large firms chase self-interested goals and this creates conflicts between owners and managers' interests. Then firm performance is affected negatively and the firm value decreases. In small firms, owners also deal the management issues and this avoid the conflicts between owner-manager interests (Glancey, 1998).

Next, we incorporate the potential effects of leverage on firm value. Modigliani and Miller (1958) asserted that there exists no relation between firm value and leverage. Though, in 1963, they took into consideration the tax effects on firm value, they reviewed this view and identified that firm value can be increased with the issuance of debt considering the financial costs. Hurdle (1974) also stated that financial leverage has positive effect on firm value. He further elaborated that high indebted firms circumvent poor investment opportunities and take the beneficial projects to improve firm value. However, Manso (2008) indicated that disagreements may generate between equity holders and debt holders due to increase in debt. Equity holders take more interest in risky projects and for this purpose, they encourage managers to take more debt because they get benefits from investments in risky projects. However, use of debt in excess may decline firm value by taking excessively risky projects (Stiglitz and Weiss, 1981).

We have also incorporated the variable growth in value model. Mueller (1972) claimed that some firm managers prefer growth to maximize rather than profitability of firms because their objective is to maximize firm value. To achieve high growth, firms avoid to take the poor projects that in turn enhances their performance.

4.2.1. Deviation from the Target Level of Trade Credits

In previous Section, we described the value model that is used to show existence of non-monotonic relationship between firm value and credit receivables. Now, in this subsection our study initiates to explore the negative impact of credit receivables' deviation from desired level on firm value. So, this implies that deviation from optimal level of investments in receivables would lessen the firm value Martínez-Sola et al. (2013). In order to get deviation from target level of receivables first, we get the residuals from receivables model equation (3) then we put the absolute value of residuals (defined by deviation) in equation (4). This deviation approach is also followed by Tong (2008).

$$REC_{it} = \beta_o + \beta_1 GROWTH_{it} + \beta_2 SIZE_{it} + \beta_3 STLEV_{it} + \beta_4 FCOST_{it} + \beta_5 CFLOW_{it} + \beta_6 TURN_{it} + \beta_7 GROF_{it} + \eta_{it} + \lambda_t + \varepsilon_{it} \quad \text{eq (3)}$$

In equation (3) account receivables are taken as dependent variable, independent variables are used as determinants of receivables. Determinants of receivables have been used in previous studies by Niskanen and Niskanen (2006), García-Teruel and Martínez-Solano (2010), and Martínez-Sola et al. (2013). $STLEV_{it}$, $GPROF_{it}$, $CFLOW_{it,}$ *and* $FCOST_{it}$ are used as control variables in the form of determinants of account receivables. Further control variables are discussed above. $STLEV_{it}$ is represented for short term leverage financing, which is calculated by ratio of current liabilities to total sales. $FCOST_{it}$ is external financing cost calculated as financial expenses to outside financing minus trade creditors. $CFLOW_{it,}$ is internal financing measured as earning after tax add depreciation subtract amortization to total sales, $GPROF_{it}$ represents gross profit computed as earning before tax and interest, depreciation and amortization total sales. Next, we use the absolute of residuals as the

measure of deviation from credit receivables. Hence, we estimate the determinants of receivables by using fixed effect regression in order to obtain the residuals.

$$V_{it} = \beta_{\circ} + \beta_1 DEVIATION_{it} + \beta_2 GROWTH_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \eta_{it} + \lambda_t + \varepsilon_{it} \qquad \text{eq (4)}$$

These residuals, we have assimilated in equation (3), $DEVIATION_{it}$ is a key independent variable, which is defined as residuals in absolute value. The purpose of the DEVIATION is to discover whether firms' value can be affected by deviation from target level of account receivables. This deviation value incorporate target level of investment in account receivables. For this aim, we estimate equation (3) exerting fixed effect regression by following Harford (1999), and Tong (2008), we expect that $\beta_1 < 0$, entails negative relationship between firms' value and deviation from account receivables' target level.

4.3. Methodology

In this section, we present methodology and also discuss the reasons why we implemented two-step system GMM for empirical analysis. OLS estimator assumes zero correlation between explanatory variables and error term. When there exists two-way causality between regressand and regressors, OLS regression provides biased as well as inconsistent coefficient estimates. This problem of endogeneity can be overcome through proper selection of instrumental variables, these instrumental variables can correlate to regressors but should not be correlated to error terms. Hence, exogeneity is required condition for regressors. If instrumental variables do not possess exogeneity characteristic then there might exist weak correlation of instrumental variables with independent variables. Therefore, these are called weak instruments.

We prefer system GMM estimator due to several reasons. In literature panel data set based on firm-level is frequently used for analysis. Furthermore, multiple techniques are employed for estimation including fixed and random effect estimators, common effect estimators, difference estimator, one step and two-step system GMM estimators. However, difference GMM estimator recommended by Arellano and Bond (1991) is considered one of the best estimators for dynamic nature of panel data. All these estimators possess not only merits but also demerits. Hence, we are following system GMM used by Cunat (2007), Martínez-Sola et al. (2013), Martínez-Sola et al. (2014), Baños-Caballero et al. (2014), and Rodríguez-Rodríguez (2006).

The system-GMM estimator is an effective estimation technique to overcome the issues of heteroskedasticity and endogeneity in the data. Moreover, it eradicates the individual fixed effect when the difference is taken of underlying variables. Undoubtly, the Arellano and Bond (1991) estimation method is preferred to other panel data estimation techniques. Since, they use instruments providing information about likely endogeneous independent variables. The regression equation in first differences consider endogeneous regressors are used by taking appropriate lags as an instruments with their own levels. . Although this difference GMM estimator reveals superior results compared to previous methods. Still, there exists the problem of weak instruments. Arellano and Bover (1995) constructed an enhanced generalized method of moments (GMM) estimator following Arellano and Bond (1991), Arellano and Bover (1995) suggested that first differenced instruments should be used for equation in level and similarly, for equation in difference variables' lagged values should be used as an instruments in their level.

However, structuring the work of Arellano and Bond (1991) and Arellano and Bover (1995), Blundell and Bond (1998) imposed further restriction . This advanced version by Blundell and Bond (1998) is well-organized than difference GMM. Blundell and Bond (1998) two-step system GMM estimation technique is more effective to overcome the finite sample biasness problem by including lagged level variables and lagged first differenced variables as instruments using moment conditions.

System GMM has an ability to handle firm-specific effects and endogeneity issues. Which may lead towards consistent results, even though time span can be consisting more than 3 years for dataset. Blundell and Bond (1998) stated that time period's minimum requirement is T≥3. System GMM is supportive to overcome difficulties relating to endogeneous regressors, by using instruments with large marix but also weighing them correctly. But even then additional moment conditions can be also required for addition of extra instruments.

The following regression equation for panel data.

$$y_{it} = a_{it} + b_{it}x_{it} + u_{it} \qquad \text{eq (1)}$$

where $u_{it} = v_i + e_{it}x_{it}$ are vectors of variables, that may be endogeneous. v_i is firm-specific effects as an unobserved time-invariant. e_{it} are error terms for specific observations. The additional moment conditions can be written as follows,

$$E(\Delta e_{it} y_{i,t-r}) = 0;\ E(\Delta e_{it} x_{i,t-r}) = 0;\ \text{where } t=3, \ldots, T \text{ and } r \geq 2 \qquad \text{eq (2)}$$

Equation (2) obtained from the requirement of difference GMM estimator for orthogonality errors' differences and variables' lagged levels used as an instruments.

$E(u_{it}\Delta y_{i,t-r}) = 0$; $E(u_{it}\Delta x_{i,t-r}) = 0$; where t=4, . . . , T and r≥ 1 eq (3)

Equation (3) shows orthogonality between specific effects of firms and variables' lagged differences, which is used to be as an instruments. This equation (3) comes out as the need for GMM level-equation estimators. If both of these two moment conditions are satisfied then it indicates the validity of additional instruments. Thus, specification tests (Hansen test for over-identifying restrictions, no order 2 serial correlation in residuals) are used to check either instruments are valid or not.

System GMM estimation technique is superior because level equations are combine used with first difference equations to acquire all possible moment conditions. Further, this estimator sustains variations among each individual firm by quantifying the model both in levels and first differences. Since, system GMM estimator effectively overcome heterogeneity across individual firms.

Still, system GMM has some flaws. In the literature, no well-established procedure introduced in order to select the set of optimal instruments. Hence, instruments utilized blindly (without prior information) may induce the problem of too many instruments. This problem might be severe when these too many instruments dominate over underlying period. We are applying two-step GMM estimator although some scholars prefer one-step GMM estimator. Because Two-step GMM estimator is robust and effective asymptotically, whatever cross-correlation and heteroskedasticity order effect the models of covariance

estimator. Two-step GMM estimator has problem of downward biasedness in measured standard errors. However this problem is resolved up to satisfactory level by Windmeijer (2005). That makes two-step system GMM estimator more effective, and produces extra efficient estimates.

We have focused mainly on two tests in GMM system (1998) dynamic estimator. The Hansen test resolves the problem by using J-test, which can be generated by too many instruments. The Hansen test (J-statistics) is employed for over-identification of restrictions, which evaluates the instruments' validity used in analysis. Which also tests for the absence of correlation among error terms and instruments. The instruments are valid, it can be only certain if second-order serial correlation do not exhibit the residuals. Our study also tests the existence of second order autocorrelation. This test ensures no serial correlation of second order in the error term (residuals). To specify this result, we use AR(2) by following Arellano and Bond (1991). This tests the presence of serial correlation of second-order in each model used for estimation.

4.5. Data

To examine the trade credit investment decisions, we construct annual unbalanced dataset for non-financial firms listed at Pakistan Stock Exchange (PSX). For this purpose, the data are taken over the period 2000-2013. We include also those firms having data for minimum three continuous years. In order to mitigate the only selection biasness problem, we allow entry and exit of firms from the dataset. Moreover, the data we extracted for analysis of the study from Balance Sheet Analysis for non-financial firms (BSANFF) presented by State Bank of Pakistan. The BSANFF includes not only data on balance sheet but also income

statement of the manufacturing firms listed at PSX. The stock prices data also, we required for calculation of Tobin's Q. Therefore, stock prices sample data of each firm, we obtained from data portal managed by PSX. We have also generated dummy for liquidity and size used as an interacted variable of receivables for confirmation of the prediction of our study.

Chapter 5

Results and Interpretation

The key objective of this thesis is to analyze the effect of credit receivables' supply on firm performance. In this chapter, we have presented the results from two core models. One is the profitability model and other one is the value model. We augment the profitability model by incorporating size and liquidity dummy. Estimation of profitability model enables us to analyze whether large size and more liquid firms get high profits in terms of receivables' financing. Similarly, the value model enables us to infer the non-monotonic receivables-value relationship. We apply the two-step system GMM estimator to estimate the profitability and value model. As we know, the accuracy of the system GMM estimation critically depends on the instruments' validity. That's why, we apply Hansen (1982) J-statistics test. In particularly, J-statistics tests the orthogonality of instruments to the residuals. For instrumental validity the second condition is that, the error terms should be independent of second order autocorrelation. Hence, we apply AR (2) test initiated by Arellano-Bond (1991) to examine the presence of autocorrelation.

The previous chapter narrates the empirical models, estimation methodology, and dataset. This chapter exhibits the empirical results. Specifically, first this chapter reports summary statistics for full sample of firms. Next, the results from the profitability model are presented. Once, the estimation results are presented for differentiating the profits from receivables' extension between large and small firms. Then, our results differentiate less and more liquid firms. Similarly, this chapter displays the results of the value model.

Finally, we present the findings when investments in credit receivables deviate from the target level.

The descriptive statistic of firm-specific variables are showed in Table 5.1, which describes the relevant information of dataset. This data description enables us to understand the economic meanings and internal consistency of estimated parameters. In particularly, Table 5.1 reports the mean, standard deviation, 25th percentile, median, and 75th percentile for the variables of value and profitability models. In these variables, we have included the dependent variables ROA (Return on Assets) used as the measure of profitability, Tobin's Q and market to book ratio (MBOOK) used as the measures of firm value. Further, we have comprised the independent variables REC_1 (ratio of receivables to total sales) and REC_2 (credit receivables over total assets) measures of trade credits. Moreover, we add the control variables size, growth, and leverage. Mean quantifies central tendency for underlying variables. Standard deviation measures the variation in the variables and shows how far the variable from its average value is. Whereas, 25th percentile lies in between of smallest and median value. Median is the mid value in arranged dataset. 75th percentile lies between median and largest value of dataset.

Firm-specific variable ROA has the highest standard deviation, 1.6496, which indicates that profitability (ROA) variable is highly volatile, signifying the extremely dispersed investments expenditure among firms. Further, we observe that the average value of ROA (profitability) is 0.0937 which shows that firms get profit about 9% through on average. The median value of ROA is 0.25, which is significantly greater than its mean value. This infers that the observations of profitability (ROA) is negatively skewed.

Table 5.1: Descriptive Statistics

Variables	Mean	S.D	P_{25}	Median	P_{75}
ROA	0.0937	1.6496	-0.7500	0.2500	1.39
Q	0.8176	0.7401	0.6427	0.7807	0.8949
MBOOK	0.4771	1.2859	0.0000	0.1332	0.4888
REC_1	0.1309	0.1731	0.0291	0.0850	0.1674
REC_2	0.0998	0.1031	0.02453	0.0706	0.1343
SIZE	7.7246	1.5211	6.7358	7.5902	8.7464
GROWTH	0.1037	0.4144	-0.0219	0.0983	0.2381
LEV	0.6539	0.1885	0.5546	0.6916	0.7821

Note: This table has provided results of summary statistics for the employed data in our analysis. Variables are $ROA, Q, MBOOK$ as a dependent variables, , here tobin's q is ratio of firms' market value to total assets, $MBOOK$ is calculated by market value of equity to book value of equity. The independent variables REC_1 here we get by ratio of receivables to total sales and REC_2 is receivables to total assets. Remaining control variables $SIZE$ is measured by natural logarithm of assets and LEV by total debt to total assets.

Correspondingly, we observe that the mean value of Tobin's q is 0.8176 with standard deviation 0.7401, median value 0.7807, 25th percentile is 0.6427 and 75th percentile is 0.8949. We note the mean value of market to book ratio ($MBOOK$) is 0.4771 and median value is 0.1332 across firm-years. We also notice that average value is significantly greater than its median value. This difference indicates the positive skewness of market to book ratio.

Further, we use two independent variables (credit receivables) given in the form of REC_1, and REC_2 ,we state the reason for using two proxies of key independent variable (trade credit) in value model is to emphasize on the robustness of results. Correspondingly,

observing the main independent variables REC_1 (trade credit investment to total sales) mean value and standard deviations are respectively 0.1309 and 0.1731. For REC_2 the results report 9.9% ratio of receivables to total assets, median value is 0.0706 and respectively 25th percentile and 90th percentile is reported 0.0245 and 0.1343. The mean value of REC_2 is greater than its median value. This states that the volatility for fraction of receivables to total assets is positively skewed. Moreover, the ratio of receivables to total assets has lowest standard deviation indicates less volatility. Further, the average value of firms' size is 7.7246 while the median value is 7.458, which is slightly greater than the average value of size. The 25th and 75th percentile values of size are 6.7358 and 8.7464 respectively. However, the median value of leverage is 0.6916, which is greater than its mean value. However, the significant difference between values of 25th percentile and 75th percentiles indicates that sample contains both high-levered and low-levered firms.

5.2. Trade Credits and Firm Profitability

In this Section 5.2, we examine the differential effect of size and liquidity with respect to receivables' supply on return on assets (profitability measure). In view of this perspective, we use size and liquidity dummy respectively taken as the interactive terms of credit receivables. As already discussed that we apply two tests, validity of instruments is tested through J-statistics of Hansen. The estimation results in Table 5.2(a) and Table 5.2(b) for J-statistic indicates that all instruments are appropriate which are used in the profitability model. Similarly, in order to check error term serial correlation, we implement the test of Arellano-Bond AR(2) in Table 5.2(a) and Table 5.2(b) shows that profitability model is well specified. Further, the estimation results are given in Table 5.2 (a) and Table 5.2 (b).

Table 5.2 (a): Firm Size, Receivables and Profitability.

(1)	(2)	(3)
REC	0.2294 (0.000)	0.3524 (0.000)
$REC \times D_{it}^{SIZE}$	−0.0883 (0.001)	
D_{it}^{SIZE}	0.1194 (0.048)	
$REC \times D_{it}^{SIZE2}$		−0.2447 (0.000)
D_{it}^{SIZE2}		0.1411 (0.023)
$SIZE$	0.2119 (0.000)	0.1284 (0.000)
$GROWTH$	0.1383 (0.000)	0.1402 (0.000)
LEV	−0.3018 (0.000)	−0.3064 (0.000)
$Constant$	0.5518 (0.000)	0.1393 (0.000)
$AR(2)$ $P\ Value$	0.82 0.414	0.80 0.423
$Hansen\ test$ P-value	291.70 0.260	293.67 0.222

Note: The estimation results have been carried out by using two-step GMM estimator. Column 2 has considered median value for generating size dummies and column 3 run the regression, for robustness check by opting same methodology use 75th percentile. The first variables' coefficients REC and $REC \times D_{it}^{SIZE}$ are relating to each other, the sum of these mentioned variables justify the profitability for large and small firms. D_{it}^{SIZE} (Dummy size) is here used to distinguish the sample in large and small firm .By considering median value to create dummies. REC and $REC \times D_{it}^{SIZE}$ here check the robustness but the difference is created by using D_{it}^{SIZE} in different way to generate dummies by taking 75th percentiles. $SIZE$, also here we have used as a control variable measured by ln (assets), $GROWTH$ is here used to observe the growth of sales, LEV used for Leverage proxied by debt to total assets. The p-values are written in parentheses and checked at 1% significance level.

First, we present results for the differential effects of size with interacted term of receivables on profitability. By considering our aim with the view, we use dummy variable (0, 1) of size to make comparison between two groups (large and small) firms.

In Table 5.2(a), we have three columns, First column (1) shows the variables of profitability model for dummy size (D_{it}^{Size}). In second column (2), we measure the dummy size (D_{it}^{Size}) by taking the median value of firm size as a criteria to distinguish the small and large firms. Similarly, in third column (3), to check the robustness of column (2) results, we measure dummy size by considering 75th percentile as a criteria to differentiate between the small and large firms.

In column (2) and (3), first we illustrate the results for key independent variable receivables (REC_{it}) are positively and significantly related to profitability (ROA_{it}) at 1% level of significance. We observe in column (2) and (3) that the coefficient of receivables' (REC_{it}) value is 0.2294 and 0.3524 respectively. If $D_{it}^{Size} = 0$ the dummy size interacted to receivables turn zero then coefficient value of receivables show the impact for large firms. Firms' profits increase with the view of receivables'' extension because of some reasons for instance information asymmetries reduces between clients and seller due to verification of quality of products (Cheng and Pike, 2003; Long et al., 1993; Pike et al., 2005; Van Horen, 2007), sustains and strengthen the relationship between customers and seller firms (Ng et al., 1999; Smith, 1987), sales rises, cash inventories and transaction costs declines.

The next variable interaction term dummy size with key independent variable receivables ($REC \times D_{it}^{SIZE}$) appears negative and statistically significant. The coefficient values of ($REC \times D_{it}^{SIZE}$) for column (2) and (3) are -0.0883 and -0.2447 respectively. This indicates

if we put D_{it}^{SIZE}=1 for small firms then we get 0.2294 + (-0.0883) =0.1411 for column (2) and 0.3524+ (-0.2447) = 0.1077 for column (3). Therefore, we get $\beta_1 > \beta_1 + \beta_2$. Our findings regarding effect of size integrated with receivables on profitability indicates that firms with large size earn more profits by providing receivables to sell the merchandise. However, on small sized firms' profitability has less effect of receivables than the large sized firms. This shows that large firms extend more sales on receivables because they do not face any kind of financial frictions and have easy access to capital markets.

Our results are consistent with previous studies for example, Long et al. (1993) and Ng et al. (1999) have reported that payment credit terms have highly importance as solution for information issues to influence interfirm trade in market. Reason provided for, larger firms' repute is more likely known for product quality. But the fact is that credit payment offer terms are designed to deal with issues of credit quality as compared to product quality. Which can increase reputation of buyers and strengthen relationship with customers and sales on credit also increase. Mian and Smith (1992) also have supported the view that large firms as credit worthy firms have efficient and developed trade credit management policies like assessment of credit risk and decision for investment in profitable projects by granting trade credits. Similarly, Peel et al. (2000) discussed that smaller firms can't access to capital market and face inadequate support by them as the terms offered by capital markets provide difficulties in provision of funds on high interest rates.

Next, we show the positive and significant results at 5% significance level results for variable dummy size (D_{it}^{Size}). The D_{it}^{Size} coefficient value is 0.1194 for column (2) and 0.1411 for column (3). This implies that on average, large size firms are more profitable.

Further, the results of control variables size, growth and leverage are discussed. Our findings are positive and statistically significant for the relationship between size and Return on assets. We report the coefficient values of size variable ($SIZE_{it}$) in column (2) and (3) are 0.2119 and 0.1284, respectively. The Previous studies have supported the positive relationship, since, Dogan (2013), for firms listed in ISE (Istanbul Stock Exchange), Lee and Jim (2009) for US public firms, Jónsson (2008) for firms listed in Iceland Stock Exchange and Artikis et al. (2009) for non-financial firms of Greek found size as a positively significant determinant of profitability. These authors justified that as compared to small firms, larger firms earn more gains, and this implies that larger the firms, higher the profitability because large firms enhances their ability due to possession of more resources and they adopt technological advancements in production. So, firms get competitive advantage as compared to small firms.

Our study finds positively significant relationship between sales growth ($GROWTH_{it}$) and profitability. We find the coefficient values of variable $GROWTH_{it}$ are 0.1383, 0.1402 for column (2) and column (3), respectively. This finding is consistent with the previous findings for example, Serrasqueiro (2009), Artikis et al. (2009), Tang (2014) and Carvalho et al. (2013). They give the justification of positive relationship that if firms' growth will be increased then firms will get more profits. This also shows that firms opt better management strategies and policies that enables the firms to increase their growth. Further reason provided, the firms having the skills to manage the sales output in more better way can increase revenues, moreover these excessive funds can be utilized for further expansions.

Finally, our findings suggest that leverage (LEV_{it}) has significantly negative relationship with profitability. The reason provided for negative association by Rajan and Zingales (1995), Dogan (2013), Niresh and Thirunavukkarasu (2014), Tang (2014), and Ramadan (2015) is that highly indebted firms have to utilize large portion of earnings for interest cost payments. Therefore, for reinvestment purposes these firms are left with fewer funds. Firms facing high debts have low profits due to high agency costs. Because firms use of debts in excess may cause of reducing their profitability.

Next, we present the results for the differential effects of liquidity[5] as interaction term of receivables on profitability. In the view of our aim, we use dummy variables (0, 1) of liquidity to make comparison between more and less liquid firms.

In Table 5.2 (b), there are three columns, in column (1), we show the variables of profitability model using dummy liquidity (D_{it}^{LIQ}). The next column (2) shows the measure of dummy liquidity (D_{it}^{LIQ}) taking the median value of firm liquidity. We use this criteria to distinguish the less and more liquid firms. Similarly, third column (3) presents the results for robustness check of column (2). In column (3), we use 75th percentile to measure dummy liquidity, which differentiates between less and more liquid firms.

In column (2) and column (3), first we show the results for main independent variable REC_{it} receivables are positively and significantly related to profitability (ROA_{it}) at 1% level of significance. We observe in column (2) and (3) that receivable (REC_{it}) coefficient values are 0.1443 and 0.2963 respectively. That explains if $D_{it}^{Liq} = 0$ the dummy of liquidity

[5] Liquidity is measured by cash and cash equivalents to total assets.

variable interacted to receivables turn zero then coefficient value of receivables shows the impact for more liquid firms.

The next variable interaction term dummy liquidity with key independent variable receivables ($REC \times D_{it}^{Liq}$) appears negative and statistically significant. The coefficient values of ($REC \times D_{it}^{Liq}$) shown in column (2) and column (3) are -0.0883 and -0.6164 respectively. This indicates if we put D_{it}^{Liq}=1 for less liquid firms then we get 0.1443 + (-0.0705) =0.0738 for column (2) and 0.2936+ (-0.2629) = 0.0307 for column (3). Therefore, we get $\beta_1 > (\beta_1 + \beta_2)$. Our findings regarding the effect of liquidity incorporated with receivables on profitability shows that firms with high liquidity earn more profits by providing receivables to sell the merchandise. However, less liquid firms' profitability is less than the more liquid firms. This shows that more liquid firms extend more sales on receivables because they do not face any kind of financial frictions and have easy access to capital markets.

In this context transaction costs' theory has supported the viewpoint for example Petersen and Rajan (1997) has considered smaller firms, whose access may be limited to financial institutions and capital markets. They provided evidence when firms may not get credits from capital markets due to limitations then smaller firms lend to larger and constrained firms. As large firms have effective capability to liquidate assets and also they possess implicit equity stakes. So, firms having access to credits offer more trade credits. Larger firms finance only growing firms as they may get advantage in various ways. By way of growing firms anticipate larger firms for capturing their business so larger firms supply credits to them. Supplier firms may get the advantage of information of controlling and

monitoring of borrower firms, their repayment management ways differ from capital markets' ways. Supplier have ability not only to sell goods but also repossession of credits which has been greater.

Similarly, According to Atanasova (2007) the possibilities of facing credit limitations due to low liquidity level might be increased. Financial constrained firms rely more on trade credits as a substitute form for institutional finance at the margin. The access of the firms to institutional loans are affected by tight monetary policy and financially credit constrained firms get access to trade credits. As institutional credit granting hold limitations to a specific class of borrowers. Limitations implemented for institutions credit granting to a specific class of borrowers. Similarly, Cunat (2007) justified to support the findings , when customers have been facing liquidity shocks. Supplier firms play an important role of liquidity providers in case when banks, financial institutions and capital markets deny to provide credits and customers face liquidity shocks. Larger firms charge high interest rates implicitly on trade credit in agreements as compared to financial institutions.

Next, we show the results for variable dummy liquidity (D_{it}^{Liq}) on profitability. The D_{it}^{Liq} coefficient values are -0.1412, and -0.2629 negative and significant respectively for column (2) and (3). Further control variables' relationship and significance has already been provided in Table 5.2 (a) description. In Table 5.2(b) also, we get the significant results.

Table 5.2 (b): Firm Liquidity, Receivables and Profitability.

(1)	(2)	(3)
REC	0.1443 (0.000)	0.2936 (0.000)
$REC \times D_{it}^{LIQ}$	−0.0705 (0.008)	
D_{it}^{LIQ}	−0.1412 (0.000)	
$REC \times D_{it}^{LIQ2}$		−0.2629 (0.035)
D_{it}^{LIQ2}		−0.1274 (0.000)
$SIZE$	0.1547 (0.000)	0.17647 (0.000)
$GROWTH$	0.1348 (0.000)	0.1278 (0.000)
LEV	−0.2889 (0.000)	−0.3188 (0.000)
$Constant$	0.2405 (0.000)	0.2364 (0.000)
$AR(2)$ P-Value	0.39 0.699	0.420 0.677
$Hansen\ test$ P-Value	262.99 0.158	181.28 0.143

Note: By using two step system GMM, above results are obtained in the same way like we did for size dummies. Here instead size dummies, we have generated liquidity dummies. Median value has been considered for generating liquidity dummies for column (2), and 75th percentiles for robustness check in column (3). The first variables' coefficients REC and $REC \times D_{it}^{LIQ}$ are connecting to each other, the sum of these stated variables justify the profitability for constrained and unconstrained firms. D_{it}^{LIQ} (Dummy liquidity measured by cash and cash equalents to total assets) is here used to distinguish the sample in constrained and unconstrained firms.by considering median value to create dummies. REC and $REC \times D_{it}^{LIQ2}$ here check the robustness, unlikely D_{it}^{LIQ2} used to generate dummies by taking 75th percentiles. $SIZE$, also here we have used as a control variable measured by ln(assets), $GROWTH$ is here used to observe the growth of sales, LEV used for Leverage proxied by debt to total assets. We have also included time dummies and industry dummies in above both columns' regressions. . In parentheses p-values are written. Significance level is checked on 1%.

5.3. Trade Credits and Firm Value

In this section, our objective of the study is to examine non-monotonic relation of credit receivables with firm value. We estimate value model equation (2) and present the results in Table 5.3. In order to check non-monotonic relationship between firm value and credit receivables, we use two measures for firm value one is Tobin's q and other one is market-to-book ratio. Table 5.3 helps us to determine the level of receivables that maximize firm value. Table 5.4 examine the negative effects on firm value of deviating from target level of investments in receivables.

We estimate value model presented in equation (2) to investigate whether non-linear relation exists between firm value and receivables. Table 5.3 shows five columns. In column (1), we present independent and control variables of value model. In Table 5.3, we run four regressions to test the non-linear impact of receivables on firm value as we use two measures for both dependent as well as for independent variable in order to check non-linearity between value and receivables. First, we run regressions for two specifications to measure dependent variable firm value V_{it} , once for Tobin's Q and we get results shown in column 2 and 3. Similarly, another specification is market to book ratio ($MBOOK$) and findings are displayed in column (4) and column (5). To check whether the results are robust, we use two different measures of receivables and run two more regressions, once for REC_1 measured by ratio of account receivables to total sales of firms indicated in column (2) and (4). We use alternative proxy of receivables REC_2 ratio of receivables to total assets for robustness presented in column (3) and column (5).

Table 5.3: Firm Value and Credit Receivables

	TOBIN'S Q	***TOBIN'S Q***	***MBOOK***	***MBOOK***
(1)	(2)	(3)	(4)	(5)
REC_1	3.0509		2.6139	
	(0.000)		(0.000)	
REC_1^2	−2.9576		−2.8028	
	(0.000)		(0.000)	
REC_2		5.4882		3.9298
		(0.000)		(0.000)
REC_2^2		−11.8086		−9.6144
		(0.000)		(0.000)
GROWTH	0.0311	0.0547	0.0907	0.0933
	(0.000)	(0.000)	(0.000)	(0.000)
SIZE	−0.1744	−0.0528	−0.0301	−0.0284
	(0.000)	(0.000)	(0.000)	(0.000)
LEV	0.01983	0.0341	0.1296	0.1069
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	2.3716	4.7493	2.9422	2.8616
	(0.000)	(0.000)	(0.000)	(0.000)
$AR(2)$	−1.390	−1.460	−0.790	−0.620
P-Value	0.165	0.144	0.427	0.534
Hansen test	352.30	355.86	353.68	354.52
P-Value	0.170	0.176	0.187	0.189

Two-step GMM has been used for estimation. In column (1) and (2), tobin's q and, in column (3) and (4) mbook ratio, both are used as dependent variables. In column (1) and (3) we have used REC_1 ratio of trade debt to total sales, for robustness check of these results additional independent variable has been used named by REC_2 proxy used by trade debts to total assets. Further variables are control variables. Time dummy has been included. AR(2) tests autocorrelation second-order with errors. Hansen test overidentifies restrictions. Size is proxied by ln (assets) and Leverage by debt to assets. Level of significance checked at 1%. p-values are specified in brackets.

First we discuss the tests applied in Table 5.3 and Table 5.4. We test validity of instruments through J-statistics of Hansen. The estimation results in Table 5.3 and Table 5.4 for J-statistic shows that all instruments are appropriate, used in the value model. Similarly, in order to check error term serial correlation, we implement the test of Arellano-Bond AR(2) shows that value model is well specified.

Now turning towards the results of REC_1 coefficient values for $TOBIN'S\ Q$ presented in column (2) and $MBOOK$ in column (4) are 3.0509, and 2.6139 respectively, these values are significantly positive at 1% level of significance. Similarly, REC_2 is used to check the robustness of results for REC_1. The coefficient values of REC_2 for column (3) labeled as $TOBIN'S\ Q$ and in column (5) labeled as $MBOOK$ are 5.488 and 3.929, respectively, positive and significant at 1% significance level. We find these results consistent with prior studies that supports different causes of benefits of investments at credit receivables. The benefits stems from the different explanations for instance, reductions of informational asymmetries regarding product quality, long-term relationship between supplier and client, and decline in transactions cost. Several researchers for example Smith (1987), Long et al. (1993), Cheng and Pike (2003), Pike et al. (2005), and Van Horen (2007) have provided theories of information asymmetries that reduce the uncertainties regarding product between clients and seller due to verification of quality. Further, the authors reveal informational asymmetrical credit terms as a screening criteria that safeguards the seller firms from non-salvageable investments. Hence, to get information about buyers helped them to invest in profitable projects.

The explanation for next benefit of long-term relations between suppliers and clients provided by several studies for example Peel et al. (2000), Cheng and Pike (2003), Fisman and Raturi (2004), and Hermes et al. (2012). These studies confirm the notion and provide the findings to support long term relations between supplier and client in terms of credit supply. The authors further mention that in long-term relationships supplier offer concessions to their clients, this strengthen their business relations. . Moreover, product quality engenders long-term relationships between clients and suppliers because supplier firms succeeds to overcome the insecurities of customers. Further, the next aim of receivables' extension is decline in transation costs. For this purpose, the findings provided by Brennan et al. (1988) and Petersen and Rajan (1997) supports price discrimination theory by context of trade receivables supply. Further, more creditworthy firms extend sales on credits and terms and conditions imply the higher profit margins. So that, they charge their clients for delayed payments and provide incentives at early payments for delivered merchandise.

On the other hand, the coefficient values of REC_1^2 for $TOBIN'S\ Q$ showed in column (2) and $MBOOK$ in column (4) are -2.9576 and -2.8028, respectively, significant and negative at 1% significance level. Similarly, Table 5.3 shows the coefficient values of REC_2^2 are also negatively[6] significant for both $TOBIN'S\ Q$ column (3) and $MBOOK$ column (5) are -11.8086 and -9.6144, respectively. This explains that account receivables not only confer benefits but also it comprises costs. Hence, investment in trade credits can't be unvaryingly and consistently beneficial for long time. Numerous prior studies like Pike

[6] The main reason for negative relationship of squared receivables is firm make excessive investments in receivables.

and Cheng (2001), Murfin and Njoroge (2015), and Derrien et al. (2016) have also reported negative impacts for overinvestments in receivables on firm value. They elaborate theories related to information asymmetries also lead in the direction of buyers' credit defaults. So that, their studies also have highlighted the problems faced by smaller firms regarding late payments of customers, by the reason of their hesitation as regards the product quality. For this cause, customer firms take long time for assessment of products' reliability and superiority. One of the major caveats of over-investment at credit receivables may cause to incur management costs. Previous literature by Sartoris and Hill (1981), Klemperer (1987), and Jain (2001) also have supported the theories of monitoring costs, transaction and other costs in formulating policies of credit receivables. Since, suppliers would have to bear administrative costs such like monitoring and screening costs and default debts.

In sum, the regression results have revealed concave shaped relationship between credit receivables and value of firm. This infers the existence of an optimal level of investment in credit receivables that balances benefits and costs, then maximizes firm value. Therefore investors have to build up the pressure on firms to limit sales on trade credits in order to lessen financial risk and opportunity costs.

Now turning towards the results of control variables, $GROWTH_{it}$, $SIZE_{it}$ and LEV_{it} as additional explanatory variables of V_{it}. Table 5.3 suggests negative and significant coefficient value for size variable ($SIZE_{it}$) for all columns, which is consistent with the findings of Shepherd (1972), Lang and Stulz (1993), Amato and Burson (2007), Becker-Blease et al. (2010), and Baños-Caballero et al. (2014). This implies larger the firm size, lower the profitability. For this, the justification provided that small firms adopt superior

management strategies to improve their repute then firm value will be enhanced. Our study has presented positive and statistically significant relationship for sales growth ($GROWTH_{it}$) on firms' value (V_{it}). This implies that increase in sales growth improves firm value. Similarly, several studies in the previous literature such like Scherr and Hulburt (2001), Niskanen and Niskanen (2006), Tong (2008), Durnev et al. (2005), and Porta et al. (2002) have also found positive and statistically significant results relationship of growth with firm value. They indicate this positive relationship that firms grown up in outstanding way will definitely grow in future and will increase the firm value. We found leverage (LEV_{it}) positively significant at 1% significance level related with firm value. Which shows increase in debt improve the firm value. The positive coefficient of leverage supports the findings of Stiglitz and Weiss (1981) and Manso (2008). This implies that the firms with high leverage evade poor investment opportunities and take the beneficial projects to increase firm value.

Once the existence of non-linear relationship between firm value and receivables has been verified. This is consequent to twofold contrary effects (benefits and costs). Now we confirm that there exists the level of investment in credit receivables that maximizes firms' value. Next, we explore in Table 5.4 the negative effect of deviation from credit receivables level on firm value. Which may cause by over and underinvestment in credit receivables. Additionally, this result is also found to be robust for alternative proxy of firm value as well.

Table 5.4: Firm Value and Deviation from the Target Level of Account Receivables

	TOBIN'S Q	***TOBIN'S Q***	***MBOOK***	***MBOOK***
(1)	(2)	(3)	(4)	(5)
DEVIATION	−0.1235	−0.3348	−0.1318	−0.4412
	(0.000)	(0.000)	(0.000)	(0.000)
GROWTH	0.0505	0.0555	0.0675	0.0731
	(0.000)	(0.000)	(0.000)	(0.000)
SIZE	−0.0507	−0.0511	−0.1681	−0.1746
	(0.000)	(0.000)	(0.000)	(0.000)
LEV	0.0356	0.0368	0.1267	0.1273
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	4.8155	4.9312	2.1747	2.3591
	(0.000)	(0.000)	(0.000)	(0.000)
$AR(2)$	−1.500	−1.520	−0.610	−0.610
P-Value	0.132	0.129	0.542	0.545
Hansen test	353.88	350.99	355.34	356.02
P-Value	0.218	0.251	0.202	0.195

Note: Above given results of all 4 columns are derived by using two-step system GMM estimation method. In column (2) and column (3), Q (tobin's q) dependent variable measured by sum of equity market value and debt book value by asset book value. Column (4) and column (5), MBOOK (market to book ratio) has been used, proxied by ratio of market capitalization to equity's book value. We have run regression for residuals by using REC_1 (ratio of trade credit to book value sales) corresponding to both dependent variables and regressors in column (2) and column (4). Same like treatment adopted for REC_2 (trade credits to assets) in column (3) and column (5).REC_2 used for robustness check of results. Level of significance is observed at 1%. p-values are stated in brackets.

In order to achieve the last objective of our study is whether firm value would be affected when firms deviate from their target level of receivables. For this purpose, we get residuals by estimating equation (3) and then place these absolute values of residuals in equation (4) named by *DEVIATION*. Martínez-Sola et al. (2013) also have followed same pattern for deviation from optimal level of account receivables with firm value in case of Spanish

firms. We have adopted this deviation approach by following the studies of Harford[7] (1999), Dittmar and Mahrt-Smith (2007), Tong[8] (2008) and Martínez-Sola et al. (2013).

The Table 5.3.1 shows negative and significant results for the main independent variable *DEVIATION*. This implies if firm deviate from target level of receivables then it has inverse impact on firm value. The results for rest of the variables *SIZE, LEV, and GROWTH* are also significant at 1% level of significance.

Now moving towards description of Table 5.4, regression results are provided for, either firms deviate from target level of receivables has any impact of firm value or not. Deviation as a main independent variable of Table 5.4, has reported negative and significant results in all 4 columns, even we get same results for robustness check for column (3) and column (5). Growth we have positive and significant at 1% in all columns, size is negative significantly relating to firm value again in all cases. Leverage has positive and significant impact on firm value.

[7] Harford (1999) use fixed effect regression for estimation of corporate cash holdings' optimal level. He define predicted value by using fixed effect regression as the measure of optimal cash holdings. Then Residuals are generated as the measure for excess cash holdings.

[8] Tong (2008) also adopts same methodology for defining optimal level of CEO ownership. He develops a methodology which study the relationship between CEO optimal ownership deviations and firm value.

Chapter 6

Conclusion

6.1. Thesis Background

There is enough literature available on why firms extend credit receivables. The previous empirical studies have comprehensively concentrated on analyzing the firm-specific determinants of receivables, firms' decisions of extending trade receivables, and determinants of performance variables like return on assets, and firm value. However, limited studies have attempted to explore the credit receivable as key drivers of firm performance. The empirical studies by Martínez-Sola et al. (2013), Martínez-Sola et al. (2014), Tang (2014), Box et al. (2016), and Kim and Sung (2016) have documented that the credit receivable has a significant link with firm performance for developed countries but the empirical studies conducted on this issue is very limited for the case of developing countries. Yet, exploring this issue regarding developing countries would enhance our understanding inclusively about financial markets of developing countries like Pakistan. So that, these aspects motivate us to study the relationship of trade credit investments on firm value and profitability.

Although, in Pakistan there are a lot of studies available regarding working capital management (WCM) and firm performance but the main component of WCM receivable is ignored. Our study is the initiative towards the research on receivable, the main component of WCM. In this study, we have considered the account receivables as a key variable of firm performance. For this aim, we have employed profitability and firm value models to achieve these objectives.

First, we have employed profitability model to study the differential effects of size and liquidity in terms of receivables' investments. So that, we have used dummies of size and liquidity respectively, interacted term of receivables (the independent variable). We estimate the profitability and value models for Pakistan using non-financial firms listed at PSX (Pakistan Stock Exchange) over the period 2000-2013. Second, we have employed value model in order to test the non-monotonic relationship in credit receivables and firm value. Further, in order to check the optimal level of receivables, we extend this value model to analyze the impact of deviation from desired level of receivable on firm value.

In terms of applying methodology, we have applied system GMM to address the potential endogeneity concerns to relationship between receivables and firm performance (firm value and profitability). To test the validity of the instruments, we have used two tests: Arrelano-Bond AR(2) tests for autocorrelation and J-test by Hansen (1982) certifies that instruments are orthogonal.

6.2. Key Findings

We find that receivables have significant influences on firm performance. Using profitability model, we test differential effects of firm size for credit receivables' granting on firm profitability. Our findings from empirical analyses showed that large firms extended more sales on receivables and earned high profits as compared to small firms. These results provided strong support to the prior studies of Mian and Smith (1992), Long et al. (1993), Ng et al. (1999), and Peel et al. (2000). They report the justifications that large firms implement developed receivables' management policies, for example credit risk assessment, and credit receivables' investment decisions in profitable projects. Large firms

are also known for good quality of products and this make their good reputation in the trade market. Large firms have easy access and support by financial institutions in order to get funds.

When we turn to examine the differential effects of liquidity, whether more liquid firms grant more credit receivables to maximize their profits as compared to less liquid firms. Our results showed strong evidence that more liquid firms maximize their profits by extending more sales on credit receivables. These results are consistent with the studies of Petersen and Rajan (1997), Atanasova (2007), and Cunat (2007). They justifies that more liquid firms help small and less liquid firms facing financial restrictions. As these small less liquid firms fail to get financial support from other sources like capital markets and banks. The more liquid firms charge high interest rates for granting trade credits. So more liquid firms support only the growing firms to avoid bad debts in future and extend receivables to promote sales and generate profits. No doubt, they have better management ways to recover and reclaim the receivables.

Another notable finding, we obtain firm size and growth sales positively and significantly related to return on assets. These findings are consistent the results of of Serrasqueiro (2009), Artikis et al. (2009), Tang (2014) , Carvalho et al. (2013) and Jónsson (2008). They have reported positive effects of both of these variables. Finally, we get negative and significant relation between leverage and profitability of firm.

Next, we turn to examine the relationship between investment in credit receivables and firm value. We have found non-monotonic relationship between value and receivables. This non-monotonic relationship rests on two differing effects one is benefits of credit

receivables and other one is costs related to this. Alternative explanations are provided in previous studies for both benefits and costs of investment in receivables. We found receivables[9] positively and significantly related to firm value. Further, we elaborated this positive relationship by various benefits of granting receivables. We expressed these benefits in different ways, for example, vendor firms employ trade credits to signal the quality and customers use trade credits to verify the quality of purchased goods and this reduces the information asymmetries (Long et al., 1993; Pike et al., 2005; Van Horen, 2007). Firms strengthen relationship with clients by extending trade credits (Ng et al., 1999; Smith, 1987) and cost of transaction decreases and sales increase. On the contrary, the results for squared term[10] of receivables showed negative and significant effects on firm value. This implies that along with benefits firms can also face costs through extending sales on trade credits like default risks of clients (Giannetti et al., 2011; Huyghebaert, 2006; Shi and Zhang, 2010), and poor credit management (Niskanen and Niskanen, 2006). Hence these benefits should offset costs and both of these effects entail concave shaped impact of trade credit investments on firm value. Further we examined whether over-underinvestment in receivables would affect the firm value. We found the inverse effects of deviation from desired level of investments in receivables on firm value.

Our analysis also suggest that the negative and significant influence of firm size on value, which support the findings of the previous studies like Lang and Stulz (1993), and Baños-Caballero et al. (2014). We also show the positive impact of leverage and growth on firm value, these effects are in line with the findings provided by Jensen (1986), Scherr and

[9] We used receivables to define benefits of investing in receivables.
[10] We used squared term of receivables to explain the cost effects for granting credit receivables.

Hulburt (2001), Niskanen and Niskanen (2006), Tong (2008), Durnev et al. (2005), and Porta et al. (2002).

6.3. Policy Implications

This study would be helpful for managers, investors and firms in adopting effective credit policies. This implies supporting terms and conditions should be in favor of customers and firms. Firm should consider the credit worthiness of customers to avoid bad debts. Our findings suggest that new opportunities for trade credit investment can be adopted for the firms of developing countries who are facing limitations due to market imperfections.

Our findings will be helpful for academic scholars, policy-makers, and firm managers to examine future sales increase. Likewise firms with extensive financial wealth may find it a strategic tool to sale their products on trade credits. Our study will also help the stakeholders in making better investment, regulation and operation decisions of business. In addition, it educates and aids the other companies regarding strategies for trade credit management and firm performance improvement. Our study will make the firms to adopt efficient management strategies in different departments i.e. Finance, Operations, and Sales and Marketing. Our study will provide these departments directions for credit receivables' practices and this supports in generating cash flows to achieve the value maximizing target.

6.4. Future Research

Our research can be extended in quite a few dimensions, some of the dimensions are stated below. No doubt, trade credit has its determinants and authors have examined these determinants and factors over the period. For future research, worth-pointing thing is that

the trade credit (one of the external financing factors) is itself vital driver of firm performance variables. Our research has focused only on return on assets, Tobin's q, and market to book ratio as firm performance variables. In future, our study can be extended by taking other measurements of firm performance like return on equity etc.

Furthermore, in this study we explored evidence on firms' trade credit decisions using panel data on firm-level. Yet, it would be valuable study to examine that whether or not firm belonging to distinct industry differ in policies for trade credit investment decisions by doing this study on industries of Pakistan Stock Exchange (PSX).

We have investigated non-monotonic relationship between value and credit receivables it would be interesting to investigate whether inverse relationship exists between value and credit receivables. This inverse relationship may force the firms to grant credit receivables in spite of the costs associated to receivables. Otherwise, sales would decline and profitability would decrease if they do not grant receivables.

Future scope of study might be extensions of working capital managements' components like practices for account payables, levels of working capital, determine liquidity and inventory control.

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