

CAPITAL UNIVERSITY OF SCIENCE AND  
TECHNOLOGY, ISLAMABAD



# Effect of Credit Rating on Trade Credit: Empirical Evidences from Pakistani Non-financial Firms

by

Muhammad Kashif

A thesis submitted in partial fulfillment for the  
degree of Master of Science

in the

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Department of Management Sciences

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*To my beloved parents and sister*



CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY  
ISLAMABAD

**CERTIFICATE OF APPROVAL**

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Evidences from Pakistani Non-financial Firms**

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## *Abstract*

This study investigates the relationship between credit rating and trade credit transaction of non-financial firms in Pakistan. Buyers and suppliers moved from traditional trading systems to advancing automated and sophisticated business methods. Although non-financial firms have better access to the financial channel but still they are getting involved in trade credit to increase the market share. This study used panel data of non-financial firms of Pakistan. The data collected from the year 2008 to 2016 from 38 non-financial firms. By using fixed effect model the study investigates that credit rating significantly effect the trade credit. This study finds that small-size non-financial firms use more trade credit as compared to large-size non-financial firms in Pakistan. Results suggests that large firms are less involve in trade credit because they are free from the problem of liquidity and access to the primary financial channel.

**Key words:** Trade Credit supply, Trade Credit Demand, Credit Rating.



# Contents

<b>Author's Declaration</b>	<b>iv</b>
<b>Plagiarism Undertaking</b>	<b>v</b>
<b>Acknowledgements</b>	<b>vi</b>
<b>Abstract</b>	<b>vii</b>
<b>List of Tables</b>	<b>x</b>
<b>Abbreviations</b>	<b>xi</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Background of the Study . . . . .	1
1.2 Types of Trade Credit Agreement . . . . .	7
1.3 Credit Rating . . . . .	9
1.3.1 Credit Rating in Pakistan . . . . .	10
1.4 Research Gap . . . . .	11
1.5 Problem Statement . . . . .	11
1.6 Supporting Theory . . . . .	12
1.6.1 Transaction Cost Theory . . . . .	12
1.7 Research Questions . . . . .	13
1.8 Research Objective . . . . .	13
1.9 Significance of the Study . . . . .	14
1.10 Scheme of the Study . . . . .	14
<b>2 Literature Review</b>	<b>15</b>
2.1 Theories of Trade Credit . . . . .	26
2.1.1 Liquidity Theory . . . . .	26
2.1.2 Asymmetric Information Theory . . . . .	26
2.1.3 Macroeconomic Conditions . . . . .	27
2.1.4 Inventory Management Model . . . . .	28
2.2 Hypotheses Development . . . . .	29
2.2.1 Size (SZ) . . . . .	29
2.2.2 Credit rating (CR) . . . . .	30

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<b>3</b>	<b>Methodology</b>	<b>31</b>
3.1	Data Description & Methodology . . . . .	31
3.1.1	Population . . . . .	31
3.1.2	Sample . . . . .	31
3.1.3	Sources of Data . . . . .	32
3.1.4	Data Analysis ( Credit Rating Process) . . . . .	32
3.1.5	Descriptive Statistics . . . . .	34
3.1.6	Correlation Analysis . . . . .	35
3.2	Econometric Model . . . . .	35
3.2.1	Panel Data Analysis . . . . .	35
3.2.2	Common Coefficient Model . . . . .	35
3.2.3	Fixed Effect Model . . . . .	37
3.2.4	Redundant Fixed effect test . . . . .	38
3.2.5	Random Effect Model . . . . .	38
3.2.5.1	Huasemen Test . . . . .	39
3.2.6	List of Variables . . . . .	40
<b>4</b>	<b>Results and Discussion</b>	<b>42</b>
4.1	Descriptive Statistics . . . . .	42
4.2	Correlation Matrix Analysis . . . . .	43
4.3	Panel Unit Root Test . . . . .	44
4.3.1	Result of Hausmen Fixed Effect Test . . . . .	45
4.3.2	Effect of Credit Rating on Trade Credit Supply . . . . .	45
4.3.3	Effect of Credit Rating on Trade Credit Supply . . . . .	48
4.3.4	Effect of Credit Rating on Trade Credit Demand . . . . .	50
4.3.4.1	Effect of Credit Rating on Trade Credit Demand . . . . .	52
<b>5</b>	<b>Conclusion</b>	<b>54</b>
5.1	Conclusion . . . . .	54
5.1.1	Policy Recommendations . . . . .	55
5.1.2	Limitations . . . . .	55
5.1.3	Future Direction . . . . .	56
	<b>Bibliography</b>	<b>56</b>
	<b>Bibliography</b>	<b>57</b>
	<b>Appendix-A</b>	<b>64</b>

# List of Tables

3.1	Table of Credit Rating Process . . . . .	34
3.2	Variables List . . . . .	40
4.1	Descriptive Statistics . . . . .	43
4.2	Correlation Matrix Analysis. . . . .	44
4.3	Panel Unit Root Test. . . . .	45
4.4	Effect of Credit Rating on Trade Credit Supply (Large Size Firms) .	47
4.5	Effect of Credit Rating on Trade Credit Supply (Small Size Firms) .	49
4.6	Effect of Credit Rating on Trade Credit Demand (Large Size Firms)	51
4.7	Effect of Credit Rating on Trade Credit Demand (Small Size Firms)	53
5.1	Appendix A . . . . .	65

# Abbreviations

<b>TCS</b>	Trade Credit Supply
<b>TCD</b>	Trade Credit Demand
<b>AT</b>	Asset Turnover
<b>LnCash</b>	Cash
<b>INV</b>	Inventory
<b>RE</b>	Retained Earnings
<b>CGS</b>	Cost of Goods Sold
<b>Size</b>	Size of firm (total Assets)
<b>CR</b>	Credit Rating

# Chapter 1

## Introduction

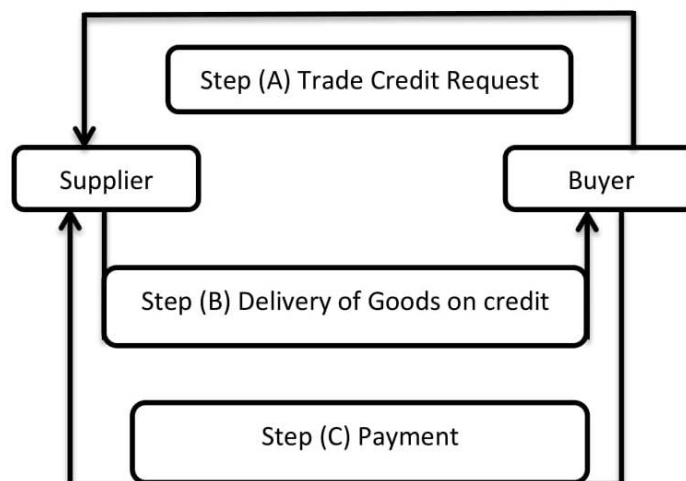
### 1.1 Background of the Study

Trade credit, is the supplier and buyer relationship which has become an essential part of today's business. Trade credit agreement is a process in which both parties (supplier and buyer) participate to fulfill the trade credit agreement. Due to problem of liquidity or shortage of investment, when customers become risky and unable to get funds, they move towards other means of finance such as trade credit to fulfill their mutual interest.

Trade credit plays a vital role in corporate financing and investment, and thus it flows like of demand and supply channels from one to another (Carvalho and Schiozer, 2015). When country experienced financial crises, trade credit is seen as an alternative of bank credit (Love, Prove and Sarria-Allende, 2007). Trade credit occurs when there is a time span between the supply of goods and the payment of goods. Therefore, trade credit is a short-term loan for companies and customers that need it. Trade credit is the most widely accepted method in the modern world, and it is also a facility for enterprises to easily obtain credit. According to Paul and Guermat (2008), trade credit is one of the important financial instruments, but researchers sometimes overlook this point. Earlier Brennan et al., (1988) defines the term "trade credit" as "a type of arrangement for the purchase of goods or services that does not require immediate payment of cash.

In trade credit agreement, goods or services are issued by the supplier to buyer on specific terms and conditions, in which buyer agrees to pay at later date. Trade credit is allowed by supplier to buyer for some predefined number of days; however these agreements can be extended by the mutual understanding of both parties. These purchases do not involve on-spot cash payment. This sort of credit allotted to the customers that are not able to run their businesses working smoothly due to shortage of funds.

Medium and small sized firms face many limitations in getting the external finance (Berger and Udell 1995). The owner/management of small firms has clear insight of their company as compared to the external parties (Storey 1994). He further states that the financial mix of UK firms indicated that trade credit is a source of finance for any firm but most preferable to medium and small sized firms. These days, many companies are using trade credit to fulfill the various business objectives, firms commonly decide to make the efficient use of capital. Marotta (1997) stated that the importance of trade credit vary from country to country. Mostly the industrial firms of different countries prefer to use the trade credit. According to the survey of Finland manufacturing companies have, on average, 9.7% receivables and 6.1 percent payable of their balance sheet items. Trade credit is a major source of capital for many business firms in US and also the largest use of capital in B2B.



**Figure 1.1 Trade Credit Cycle**

Study of Ahmed and Khalid (2016) indicates that trade credit provides capital to firms that are not able to get funds by traditional channels. It is one of the basic goals of firms to expand their businesses to make profit and also to remain in business. Trade credit provides benefits to the supplier and buyer to expand their businesses and build long term relationship. Supplier provides capital to the buyers as they want to capture their business. Unlike the financial institutions, supplier can get the better information about the buyer. Unlike the financial institutions, suppliers use the information for controlling and monitoring the payments in a different way. So the nature of trade credit varies from buyer to buyer.

Supplier can take back goods and sell them to some other buyers. By usage of trade credit the cost attached with transactions has been reduced. Countries like Italy, Germany and France have represented trade credit as firms assets for last 25 years. As per (Ge & Qui, 2007) trade credit also has importance where firms acquire limited resources from banks in emerging economies like China. According to the trade credit contract, when supplier provides supply to the buyer, often the buyer is not immediately ready to pay on spot to the supplier. So suppliers provide credit term to the buyer to pay at later date.

Trade credit transactions typically require a delay in payment by the ultimate buyer to the supplier of a purchase item that provides a short-term debt or loan to the customer. First, suppliers mostly deals in "kind of product" rather than cash transaction. Second, as compared to bank, trade credit is not a formal contract between a supplier and a buyer, but it mostly depends on personal relationship between them. Third, non-financial firms of Pakistan mostly deal in trade credit transaction.

Trade credit was an important part of the balance sheets of all US companies in the early 1990s. Deloof and Overelt (2011) and Ge and Qiu (2007) point out that getting bank loans is easy when your relationship with banks are good or you are a state-owned enterprise. They further explained that firms of United Kingdom stated in the balance sheet that they have accounts payable up to 70 percent as short term debts while 50% of short-term debt consists of trade credit. According

to Garcia and Solano (2011), there are many non-cash related motives of trade credit that serves the interests of buyers and suppliers.

Because all investments do not guarantee a return on investment (ROI), certain risks may be involved. If the owner of a business is disappointed or confronts underinvestment, he turns to trade credit. Vendors are willing to offer credit to buyers due to the supplier's market knowledge and buyer's financial and business conditions. Therefore, trade credit is appropriate for buyers and suppliers to serve their business interests. According to a study by Ahmed and Khalid (2016), when a company face credit limitation they move towards trade credit to achieve its business purpose and improve the firm wealth to generate profit and secure the market position.

Trade credit is an external source of funds for short-term corporate financing. There are two perspectives of firms to reliance on trade credit; first, accounts receivables are generated when funds provided to customers in rendering goods or services to them on account. Second, when funds provided by suppliers through the provision of goods or services, they will generate accounts payable. From the perspective of accounts receivable and accounts payable, the company defines its trade credit policy. For many suppliers, trade credit plays a very important role, such as for future sales, non-salvageable relationships and specific investment depends on the customer's financing capacity (Smith, 1987).

At present time, no one can ignore the role of money in the survival of individuals and businesses. Like all other resources, money is a necessary part of business formation and business growth. Almost all financial analysts believe, money as helping hand of all organizations, and it is a primary driving force for all internal and external task of the company. Due to this reason, all firms need the availability of funds at right time and in appropriate amount as well as they describe the sources of these funds to obtain and utilize (Hamouri and Radaydeh, 2014). Sources of money/funds may be external or internal. Firms use funds from internal sources, such as retained earnings, while externally they go to borrow or issue new shares. When firms need funds, financial managers or policy makers analyze the appropriate source for provision of funds. In order to determine a better source



of funding, it is necessary to consider the cost of funds before financing. This decision will reduce the company's cost of capital.

Banks use sensitive check and balance mechanisms to monitor the customers' financial status. Banks have adequate risk assessment programs to overcome default. Banks require some type of security which will be pledged in case of default. Buyers already face a situation where they cannot provide guarantees and therefore do not have access to bank loans. Trade credit is therefore the best way for high risk customers. According to modern investment theory, high investment risk concentration leads to more investment return. Potential investment losses make your business more dangerous or risky.

According to Beck et al., (2008) and Ge and Qiu (2007) in developing countries, trade credit is a financial channel that makes major services more convenient than the financial industry. Berger and Udell (1998) and Acharya (2009) propose two main funding methods: trade credit and bank financing.

From a supplier point of view, there is always a risk in an investment or product, but if you do not take this risk into consideration, you will lose the opportunity. The seller/suppliers knows that the customer is at risk and still starts the contract because he provides the product and knows the market situation. Many companies in Europe have been closed due to bankruptcy. Many managers have motto "sale is not a sale until it is paid for" and written on a desk as well as on heart to actively participate in their role. In many kinds of businesses, trade credit can be a source of corporate financial growth.

Trade credit is a contract or agreement whereby companies buy supplies from other companies on credit instead of paying immediately they agree to pay in the near future. Suppliers become financial intermediaries when they decide to finance the arrangement on firm reputation and size. According to the Meltzer study (1960), these suppliers extend the financing of trade credit to deprived enterprises. In fact, in trade credit, non-financial companies record suppliers' who provides goods and services on credit as accounts receivable, while recipient companies report accounts payable in their balance sheets. Because of this function trade credit is considered as short-term financing of the business.

Trade credit allows buyers to take their goods now and pay later. The scope of trade credit may be determined by the mutual trust between the supplier and buyer company, and both parties are required to agree according to the terms. This type of credit encourages sales. Bank loans are not completely ignored or prohibited, but companies demand more desirable alternatives like trade credit. Bank lending takes longer time and is more complicated. This is why SMEs prefer trade credit. Trade credit helps companies to create new investment plans and create new markets that are more productive for the company's success. In competitive environments it is time saving and helpful for new companies to turn toward trade credit. In US trade credit as debt is twice as much as any other debt. In the 1990s, US trade credit ratio averaged \$ 1.4 billion across all countries.

According to Martinez-Sola et al. (2011), companies offering trade credit are more profitable than companies offering no trade credits. Petersen and Rajan (1994), Saarani and Shahadan (2013), and Molina & Preve (2012) are of the view that trading is largely dependent on the availability of bank loans and the trade credit size will increase if buyers are unable to obtain loans from financial institutions.

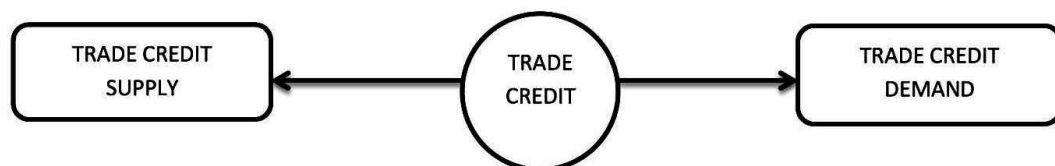
The use of trade credit plays an important role in the economic and finance fields and has become a bright spot in the recent literature. According to the results of Alphonse et al. (2003) clearly stated that trade credit increased when bank debt is shortfall. The study further pointed out that companies cannot obtain bank loans or low availability of bank debt, and businesses or individuals use trade credits. The study by Frank and Maksimovic (2004) emphasizes that trade credit helps suppliers and borrowers to meet their financing and investment needs, especially when financial markets are inefficient.

In most developing countries, such as China, bank lending is not easy to use. It is difficult for non-state owned enterprises to get loan as compared to state-owned enterprise. A survey by the World Bank (2000), non-state-owned enterprises in China received less than 1% of bank loans at the end of 1990. State-owned enterprises can easily receive loans from banks, but growth rates of non-state owned firm are much higher than the state owned firms. The state-owned enterprise is

considered more reputable either they are a financial or nonfinancial firm. According to the records of 370 different cities in China from 1989 to 1991, state-owned enterprises can easily obtain bank loans. These state-owned companies that can secure funds from banks account for only 20% of China's total industrial output; still they are only eligible for this purpose.

## 1.2 Types of Trade Credit Agreement

The supplier must require the full payment against the delivery of goods. The length of time period for payment specify in contract. "Net 30" means the payment will pay within 30 days. "If the buyer does not pay stated payment on time, the supplier will charge a late fee." when buyer agrees to pay the agreed amount of transaction within discount period the supplier will offer him less amount of transaction. Early payment provides opportunity to the buyer to get early delivery of product in future. If buyer does not pay within discount term, he has to pay the full amount within 30 days.



**Figure 1.2 Trade Credit Agreements**

According to Figure 1.2, trading credit is a two-way contract. According to Ahmed, Xiaofeng and Usman (2015), in balance sheet, when trade credit becomes the part of assets it shows as account receivables but when it seem on the liability side of balance sheet it shows accounts payable. Accounts receivable is a proxy for trade credit supply. Accounts payable is a proxy for trade credit demand. Trade credits predict the nature of a contract. The Company's financial accounts include receivables and payable. Trade receivables are a major part of current assets. On the other hand, accounts payable is the most external funds, such as short-term debt.

Trade credit is basically a demand and supply contract. When buyer demands goods the supplier will give supplies according to the demand of buyer. Figure 1.2 shows the relationship between a supplier and a buyer. When contract requirements are met, the customer asks for goods and suppliers send the goods to buyer. The company must pay for the product in use. Therefore, the trade credit relationship has two-way relations in terms of demand and supply. One point, the buyer's company receives goods from the supplier on credit as account payable. Another point, when supplier provides goods on credit record it as account receivable in balance sheet.

As per the (1998) survey of SME Finance Survey (SSBF), supplier offers discount terms to the customer so that they pay at early. In almost 90% of companies, trade credit used as short-term corporate debt. The fact behind this is that suppliers offer different terms and relatively stable terms for different buyers. In the case of trade credits, many alterations implemented by supplier for ease of buyers and as well as helpful for the industry. In order to adapt the changing demand, suppliers tend to change product prices than price of credit.

According to suppliers, trade credit has several advantages over bank borrowing. This is because the supplier can more easily get the quality information of the buyer's company. Suppliers pay close attention to the customers discussed by Dell, Laevena and Marquez. (2014). According to a study by Burkart & Ellingsen (2004), suppliers have a low liquidation risk because traded goods themselves are strong collateral for suppliers. Study by Garca & Solano (2011) show that problems such as asymmetric information, moral hazard and adverse selection has a greater impact on commercial loan applications as compared to trade credit transactions. SMEs are more interested in increasing their market share by increasing trade credit.

Suppliers offer more concessions to their customers than financial institutions like banks. According to Dell, Laevena & Marquez (2014) looking for the right seller at the right time is a problem and maintaining the relationship is another matter. Allowing buyers to accept payment delays is natural for long-term relationships. Suppliers can distinguish buyers.

According to Cunat (2006), when a company faces the problem of liquidity and negative growth rate, trade credit also affect the growth process of the company. As per the study of Petersen and Rajan (1997), those companies which already in financial crisis are more interested in expanding trade credit because trade credit is the source to increase the receivable for company. This gives suppliers flexibility in payment. Trade credit contract extended for many periods. The relationship between the parties is an ongoing process, as the supplier becomes the buyer and the buyer becomes supplier.

Smith (1987) and Maksimovic (2008) explain that buyers are more likely to choose business-related contracts when dealing with trade credit contracts, depending on their financial situation and business characteristics. Trade credit used to describe the status and financial condition of a buyer in the business world. In order to adapt changes in demand, suppliers are willing to accept changes in product prices than the credit terms. Discounts can also adjust in the price of the product and discount offered also varies from customer to customer.

### 1.3 Credit Rating

A credit rating is an assessment of the creditworthiness of a borrower in general terms or with respect to a particular debt or financial obligation. A credit rating can be assigned to any entity that seeks to borrow money an individual, corporation, state or provincial authority, or sovereign government. The evaluation does by a credit rating agency to assess the debtor's ability to repay debts and the chance of default. This rating includes a qualitative and quantitative assessment of company or government information.

This is especially helpful for those who need to use it. Financial intermediaries, such as banks, brokers, insurance companies and others as professional debt service providers, and in most cases they have the resources and the ability to get the necessary information for the borrower. A credit rating is one of the tools investors and organizations use to identify the borrower or government ability to fulfill their obligations. A credit rating indicates a company's credit worthiness, which

indicates the ability of the company to repay its debt (Moody's Investors Services, 2002).

Credit rating gives forward-looking opinion on the credibility of issuer and issues. The term credit quality refers to the probability/ability of the buyer paying interest and principal on time in accordance with the terms of the contract, but not the absolute ability (S and P Credit Portal, 2009). Credit ratings show many of the factors that make up an overall credit rating.

Credit rating agencies issue credit rating to indicate the company's ability to meet its financial obligations. Because companies cannot accurately outline each other's financial position, many companies relies on rating agencies to accurately describe the debtor's ability to meet its obligations. It indicates that a favorable credit rating is important to get favorable terms and conditions when firms issue debt on financial markets. Therefore, the credit rating process must use a lot of subjective judgments. In addition, the rating symbols are designed to show the general credit rating of issuers and issuers of different industries, industries and at different times (Standard & Poor's Global Credit Portal, 2009).

Investors, intermediaries, financial institutions and non-financial institutions use credit rating to assess credit risk for its own purposes. Investors use credit ratings to assess credit risk and assess different issuers and debt issues when making investment decisions.

### **1.3.1 Credit Rating in Pakistan**

There are two major credit rating agencies in Pakistan. The first one is PACRA and the second is JCR-VISE. Pakistan Credit Rating Agency (PACRA) was established in 15-06-1994 with the collaboration of International Finance Corporation (IFC), IBCA Limited (International Credit Rating Agency), LSE (Lahore Stock Exchange) and Fitch Ratings. JCR-VIS is a full-service credit rating agency, approved by the State Bank of Pakistan and the Securities and Exchange Commission of Pakistan, which provides independent assessment services in Pakistan. It is a

joint venture between Japan's Premier credit rating agencies, Vital Information Services Ltd., the Karachi Stock Exchange and the Islamabad Stock Exchange.

The symbols used in PACRA and JCR-VIS both are same as big three. The symbols used by PACRA for credit rating categories are minus and plus sign. The sign of minus and plus is not used in long-term rating categories from AAA and to below CCC. The evaluation is the role of the credit rating committee and their benchmark is properly followed.

## **1.4 Research Gap**

Pakistan's non-financial firms suffers from loan regulation and trade credit is an external financing source helps solve buyer liquidity problems. As a result, an increase in corporate credit ratings can increase the likelihood that a business acquires trade credit under simple terms and conditions (Chou, Yang & Lin 2011). The study will empirically test the impact of credit rating on the trade credit supply and demand of non-financial companies in Pakistan.

## **1.5 Problem Statement**

Non-financial companies in Pakistan as to overcome the problem of default they need to build good relationships with financial firms. According to Smith (1987), banks have reduced credit limits for companies in Germany. However, bank loan availability considered as a major issue for non-financial firms in Pakistan. There is a risk that the buyer company may not able to get funds due to lack of security/collateral. As risk increases, buyers need to find other convenient and less time-consuming external source of finance for business. Trade credit is the best way for companies where supplier already involved in business provides more help and support to businesses which are facing financial distress. Thus, the expression of this problem is "the use of trade credit has increased because of the high credit rating of non-financial firms".

## 1.6 Supporting Theory

### 1.6.1 Transaction Cost Theory

Cyert and March (1963) for the first time initiate the transaction cost theory that was later on thoroughly explained by Williamson (1996) with theoretical assumptions. According to them transaction cost occurs when there is an economical exchange. Firms pay commission for collecting information and thus transaction cost occurs. According to Williamson (1981), management of firm bears transactions cost when it pays commission for services and extra advantages. The study further argues that transaction cost occurs every time when goods or services are transferred from one to another.

The trade credit plays an important role in reducing transaction cost of a firm. According to Ferris Transaction Theory (1981) he proposes that trade credit reduces the exchange costs of products and services and hence the transaction cost may reduce due to trade credit motives. The theory further argues that in trade credit the transactions of buyer and seller become regular and hence reduces the transaction cost of both parties. So, when transaction costs are reduced, it creates more holding power of receivables for the firm. Trade credit reduces cost as it makes the supplies of goods and credit financing from one point. Supply of goods on credit are also credit financing and both exist on one account.

According to Mian and Smith (1992) the transaction cost reduces as the supply of products and services are taken from one point and hence it also increases efficiency in monitoring and exchange relationship. The assumption from the findings of Petersen and Rajan (1997) also suggests that trade credits can be used by firms for cost benefits. From lenders point of views they have very less information about the buyers or borrower as compared to credit suppliers. Information about buyers or borrower is necessary for credit and supplies, and hence suppliers have traditionally better advantages in trade credit due to strong informative relations (Schwartz, 1974).

Other theories related to trade credit are discussed in literature review at (page 25).



## 1.7 Research Questions

This study tried to answer the following questions:

### Research Question 1

What is the impact of Credit Rating on Trade Credit Supply?

### Research Question 2

What is the impact of Credit Rating on trade Credit Demand?

### Research Question 3

Does the impact of Credit Rating is differing for small and large size firms trade credit supply and demand?

### Research Question 4

What is the combine effect of size and credit rating on trade credit?

## 1.8 Research Objective

Objectives of the study are as follow:

### Research Objective 1

To determine the relationship between credit rating and trade credit supply.

### Research Objective 2

To determine the relationship between credit rating and trade credit demand.

### Research Objective 3

To determine the relationship between credit rating and trade credit for small and large firms separately.

### Research Objective 4

To determine the combine relationship of credit rating and size (credit rating \* size) for small and large firm trade credit.

## 1.9 Significance of the Study

For buyers and suppliers, trade credit is a good source of short-term financing. Trade credit used as a source of funding to effectively use resources and increase business sales. Trade credit providers can easily check the creditworthiness of the buyer through the credit rating developed by an independent third-party. Trade credit agreement provides the means to manage the way a business operates without disturbing other loan related issues. On other hand, buyers have the advantage that they do not have to face the problem of liquidity and can do credit transactions directly with the supplier.

From the analysis, this study proposes investors and stockholders to take concern on investment in trade credit. It enlightens the market players in making decision related investment, operations and regulations of business. In addition to financing, firms may also practice the trade credit in sales & marketing, and operations department for cash flow generations to maximize sales and growth. Firms when analyze the benefits of trade credit may create a policy for it in the business model for many advantages as briefly discussed earlier. Firms may also be interested in determining optimum level of trade credit that can be used for financing. This study provides basis for setting up the level of trade credit to be maintained by the firms.

## 1.10 Scheme of the Study

Rest of the study is arranged as under: chapter 2 fundamentally covers the literature regarding the subject. Chapter 3 provides data description and methodology which contains the econometric model and section 4 deals with results and discussion, limitation and future direction while chapter 5 deals with conclusion, recommendations and future direction of the study.

# Chapter 2

## Literature Review

This part of the study covers the literature review as regard to the trade credit and credit Rating. The efforts of past theorists and findings about the trade credit. Also, discussed the theoretical background related to topic and hypothesis.

Non-financial firms have different several ways to generate the need of their capital. According to the theories there are two major means to generate the finance; the first one is short-term financing and the other one is long-term financing. Long term financing is more favorable to generate the profit but it requires the immense investment in business. The other one is relatively less profit generating but it gives the edge against the downfall of the firms. When customer face risk, he should surely move to other easy ways of financing like short-term financing and it became more attractive for her to get involved in. According to theory, issues arise in the market due to asymmetric information. This informational asymmetric occur when some suppliers are well-informed about the product deployed as compare to other suppliers. Due to asymmetric information, opportunity created for some of the suppliers to mold their ways of doing business than other supplier in the same business.

Trade credit is one of the alternative ways that solve the issue of short-term financing. Trade credit is a contract in which the seller agree to provide the goods/services to buyer and payment will paid in future according to the terms and conditions of contract (Martinez Sola et al., 2012). Therefore, trade credit is a

vital mean for all sized firms especially for medium and small firms. Petersen and Rajan (1997) explained different theories for the reason that stable firms can easily get the help from financial institutions but the unstable or small/newly entered in market firms move to find the other resources of financing that are useful for the business. Trade credit helps the buyer and seller to simplify the cash management and increase the efficiency. Trade credit is a best mean to check the creditworthiness and financial standing of the buyer.

According to Ferris (1981) in trade credit theory, trade credit is a mean that used to reduce the attached cost with the transaction. Stated by Peterson and Rajan (1997) in early 1990 the trade credit is an important segment of balance sheet of all American firms, 18% of total assets recorded as account receivable. They find that large firms borrow and lend more trade credit. Larger firms prefer to borrow more although their cash flow are higher and fewer opportunities of growth. It indicates that they are more creditworthy.

In UK, such as, short-term debt observed as 70% account payable in balance sheet and 50% as accumulated debt of companies. According to the study of Burkart and Ellingsen (2004) in France, Germany and Italy trade credit observed a quarter of corporate assets and in emerging economies where firms felt difficulty to get the bank loans like China (Ahmed, Xiaofeng and Khalid,2004). In trade credit, supplier has comparative advantage to collect the information easily and quickly about the customer than the financial institutions. Suppliers have information advantage over the financial institutions.

As per stated by Summers & Wilson (2002) trade credit as a tool to fulfill the business aspects. When a new business entered in market can gain reputation and success if they used the trade credit transactions because the use of trade credit build new relationships in the market. Small and medium size firms are not able to secure the finance on easy term and it leads them to fail. As per Ono (2001) suppliers have advantage and power over the customers and they know the financial position of customer by controlling the supply of goods. Smith (1987) stated that when discount issued to the buyer ultimately represent the weak financial position of buyer. When financial institutions deny granting the credit then firms move to

find another options and trade credit extensively used by firms (Petersen & Rajan, 1997).

When a small amount of funds required for business work, it becomes hurdle in the way of progress and to borrow for this motive a lot of interest required to pay (Storey, 1994). According to the economic theories these problems arise due to asymmetric information. In Pakistan trade credit contract used as source of finance most time for non-financial firms. According to Frank and Maksimovic (2008) due to instability in financial market, buyer and supplier can avail the facility of trade credit relationship. When problem of finance availability arise, buyers always turn toward the other way like trade credit contract which is favorable to serve the purpose.

Found by Ahmed, Xiaofeng & Mujtaba (2015) that use of trade credit increased due to financial crisis of 2008 in country. Trade credit serves the purpose for the buyer to sustain in the competitive market. In developed as well developing countries it indicates a strong effective use of trade credit. In early of 1990 all American firms had 17.8 percent of total assets belong to trade credit (Rajan & Zingales, 1995). As per the study of Kohler (2000) trade credit is recorded as 55 percent of trade credit received by other firms. According to the study of Martinez-solano (2013) trade credit parameters and firms characteristics vary according to culture and determined that nature of trade credit influenced by different cultures differently.

Trade credit is an external way to finance the company and it is cheaper at discount if buyer pay earlier (Giannetti et al., 2011). According to Jain (2001) trade credit is a financial source for companies and it is a direct relationship with business. Due to inefficient financial markets, both parties buyer and supplier mutually use trade credit to expand their businesses (Maksimovic, 2008). Small and medium size enterprises can easily get the trade credit from their supplier as compared to bank loan to run their business.

As per Buch, Eickmeier & Prieto (2014), already existed firms are more interested in debt financing as developed countries are concerned. Financial institutions spend more money and effort to gather information about the financial position

of their customers and the product that they want to use but on the other side supplier can get more accurate and updated information about the customer at some effort because they are linked with same industry or business. To recover the amount in trade credit is an easy task as compare to financial institutions.

when customer shows delay for payment it provides clue to supplier to stop the supplies of that specific customer in future. According to contract when buyer becomes unable to pay the stated amount to the supplier still supplier has benefits to repossess the supplies and sell it other buyer. But bank could not do this easily. There is no need of proper documentation in trade credit contract on the other hand it is required by financial institutions.

Trade credit and bank loan are two sources of finance has been a signal between buyer and supplier (Jimenez, Lopez & Saurina, 2013) and (Maksimovic, 2008). Carbo, Rodriguez, Fernandez, and Udell (2016) mention that supplier act as intermediary because of low-cost. Non-Financial firms (especially small firms) face the problem of non-availability of short term debt from banks. In corporate financial policy of each firm trade credit play an important role. Financing through trade credit serve the purpose of investment for business. The balance sheet of European firms shows that trade credit supply is the part of firm assets. Stated by Beck (2008) and Ge and Qiu (2007) trade credit serve the purpose of external finance for those countries which are still underdeveloped because these countries have not access to the proper financial institutions and they are unable to meet the requirements of financial institutions.

Petersen & Rajan (1997) and Niskanen & Niskanen (2006) have investigated the use and impact of trade credit in different countries. In early 1990s' trade credit is considered as an important item of American firms balance sheet (Rajan & Zingales, 1995). According to theorists Smith (1987) and Long (1993) trade credit is the assurance of product quality as monitoring tool and also serve for reduction in information asymmetry for buyer. According to Coleman (2000) small and medium-sized firm are not able to secure required finance due to this they face failure as compare to large firms. According to supplier view, to discriminate the price to the buyer, suppliers extend goods on credit (Emery, 1987) and (Rajan,

1997). Ferris (1981) in transaction cost theory suggested that trade credit serve as best means.

Wilner (2000) and Cunat (2006) stated that supplier offer discount to depressed customers and to keep up long-term relationship and to settle the liquidity problem of their customer. Countries like Italy, France and Germany and developing countries which include china where companies have more trade credit than their total assets Ge & Qui (2007). Commercial banks in developing countries are more tentative about financial corresponding of non-financial firms Rajan & Zingales (2003).

According to Long et al.,(1993) large size companies have good reputation and have more storage capacity for holding inventory but not face the liquidity problem as compared to small firms as per inventory management model and they can get funds from any other source. The importance of trade credit varies from industry to industry and country to country. Where production of goods is an integral part of economy, in those countries trade credit user are more explained by Marotta (1998).

To resolve the problem of liquidity, small firms are more interested to issue the trade credit. Large companies show less interest in credit transactions and they not need to give the guarantee of their products (Long et al., 1993). According to Beck, Kunt & Maksimovic (2008) as per the survey of 48 countries, they have 19.7 percent investment has been financed by trade credit as external source. Developed countries like UK and France more than 30 percent finance is trade credit as external source. Explained by Elliehausen and Wolken (1993) that in US 60 percent of small firms use trade credit as a major financial source. According to Berger, Udell (1998) and Cunat (2006) firms at beginning and younger firms mostly rely on trade credit as external source of finance. Supplier offer more helping hands and provides working capital financing to them. According to Cook (1999) these offers enables the buyers to start a new era of trade and to form a new history of payments for their near future.

The role of trade credit for development still less studied in academic perspective in the field of trade credit than other type of financing. In many cases, when supplier

issue trade credit he charge zero interest to their buyers. Trade credit allow the buyer to pay later after the delivery of goods, to keep the long-term business relationship with buyer, the supplier issue goods in small amount or mostly at discount. Stated by Schwartz (1974) that trade credit has been used widely and its importance is still more than other external source of finance. Transaction cost theory and information asymmetric theory is economically significant and thoroughly explained the trade credit demand. Buyers face credit constraints as they face investment opportunities, and they can increase their investment through business expansion. And they can easily gain market share and prosperity with increasing sales.

Emery (1987) argues that trade credit is a financial response to variable demand. Consider a company that experiences a sudden decline in demand. The company has two options. Either build up expensive inventory (which may or may not be sold later) or provide trade credit to customers that may be financially constrained. There is clearly a trade-off between inventories and trade credit. Trade credit is mutually beneficial arrangement for supplier and buyer. Enterprises that offer trade credit must have the financial cost to withstand (decline in demand) advantages but have to be disadvantaged in holding up the operating costs of higher finished goods inventories.

Fabbri and Klapper (2008) stated that firms that get the trade credit from supplier is also more likely to extend trade credit to customers and match the time period of their payable with the contractual terms of receivable. They also found that companies with higher retained earnings are less likely to finance their own accounts payable, and companies that rely on expensive, informal sources of finance are more likely to match the accounts payable and receivable. As a result, trade credit activities are more likely to become self-sustaining sources of financing for these companies.

They found that firms that used retained earnings to finance themselves had a strong connection with extending trade credit to their customers, which was similar to the finding that profitable private firms were more likely to expand trade credit. Since these companies also do not tend to rely on suppliers' trade credit,



they are net providers of trade credit, presumably to creditworthy but financial constrained firms. However, it speculated that if trade credit is an informal financing mechanism to increase efficiency, we expect more profit-making enterprises to expand trade credit. Petersen and Rajan (1997) argue that troubled companies may use their trade credit extension to sustain their sales, while some of the trade credit offered by economically disadvantaged businesses may be involuntary.

According to (Yang and Lin, 2011), CGS has a strong positive impact on accounts payable for all firms, with estimate for large enterprises being higher than estimate for small businesses, similar to the CGS and accounts payable. That is, the relatively large amount of account payable used by large enterprises in their operations compared to small one means that large enterprises have ability to get more trade credit from suppliers.

According to Vaidya(2012) the inventory-to-sales ratio relating to trade receivable is inversely related ( at level of 5%). When inventories are split into finished goods inventories and raw materials and semi-finished goods inventories, the finished goods inventory coefficient is negative (at level of 1%). Raw material stock coefficient result shows positive but not significant. This indicates that firms have more account receivable with lower inventories of finished products, so the enterprises give more trade credit to stimulate sales and cut the finished goods inventory. Therefore, inventory management is an important for enterprises to provide trade credit to other enterprises. The inventory reason has a positive sign of accounts payable, but only significant at the 10% level. When we classify inventories, both finished and raw material inventories have positive and significant signs of greater finished product inventory. As the company piles up both types of inventory, they get more trade credit trade and thus offer to companies that have suffered a negative impact on sales.

Inventories always have a positive impact on accounts payable, with estimates for large enterprises being higher than those for small businesses. This is consistent with the explanation that accounts payable can be issued against stock, especially for small businesses, because stock can be easily liquidated. Stocks have a strong negative effect on all companies, especially for big companies. Negative effects may

show that stocks are used as a buffer against internal financing as an alternative to accounts receivable (Carpenter, Fazzari and Petersen, 1994) and (Choi & kim, 2001).

According to Yang and Lin (2011) cash and cash equivalent held by the company have a positive impact on accounts receivable and trade payable. Companies with more bank credit can offer their clients less trade credit. Even it shows that the company has no liquidity problems. Companies with more bank loan will not pass them on to their buyers as accounts receivable. In addition, owning liquid assets may signal the ability to pay back on time.

A company's credit rating reflects a view of rating agency on the entity's overall credibility and ability to meet its financial obligations (S & P, 2002).

Ashbaugh-Skaife, Collins and LaFond (2006) point out that credit ratings are determined by rating agencies that assess the probability distribution of future cash flows to bondholders, and future bondholders' future cash flows depend on future cash inflows. The creditworthiness of a company is determined by evaluating its future cash flows sufficient to cover the cost of debt servicing and the principal payment. As the company's future cash flow distribution moves downwards, or its future cash flow changes increase, chances of default increases and the company's credit rating declines. Due to the decline in the company's expected cash flow, the increased default risk of bondholders led to a decline in credit rating. This increases the likelihood of a default, resulting in a lower credit rating.

Since the credit conditions and terms usually do not affect to the credit quality of buyer, it reduced the effective price to the low quality buyers. Since the credit conditions usually do not affect the credit quality of the buyer's trade credit, the effective price of the low quality buyer is low. Highly rated credit customers will find high price of trade credit transactions, and they repay as soon as possible. But risky customers may find it worth borrowing because trade credit may still be cheaper than other sources. Buyers' inability to take advantage of advance payment discounts can use as a trip wire to alert supplier buyers of deteriorating creditworthiness. If we find that larger companies have higher receivables, we can explain that large companies have better capital market access. Because

of their limited credit restrictions, they provide more credit to their customers (supply effects). On the other hand, larger suppliers may sell to small startups businesses with tiny access to capital market. In this case, the credit demand of large corporate by their clients is high.

The level of accounts payable is once again determined by the credit provided by the supplier to the business and our firm need for the future. According to Petersen & Rajan (1997), small companies generally use less trade credit than large firms. Accounts payable by large companies accounted for 11.6% of sales, while accounts payable by smaller companies amounted to 4.4% of sales. Small businesses also extend less trade credit.

Peterson and Rajan (1997) also point out that the borrowing on and extension of trade credits increases with the size of the company. Trustworthy companies get more institutional credit. Often, large companies have more borrowing, even though larger companies have higher cash flows and fewer growth opportunities, which suggest they are more reputable. Companies that already have positive growth provide slightly higher receivable.

Petersen and Rajan (1997) argue that the creditworthiness of a company should influence the credit lines it provides. Quality of a company credit is especially important in deciding whether or not to provide credit. The explicit price of trade credit does not seem to vary with the quality of credit. According to Smith (1987) customers in an industry receives standard trade credit terms. If suppliers do not use prices and they do not charge lower-quality borrowers for higher and definitive prices, then they must use a quantitative limit. Therefore, we expect more high-quality businesses to get more trade credit. Changes in the size (dummy) and credit ratings of large and small enterprises have led to significant improvements in credit quality and a decline in credit quality.

The terms and conditions charged by the supplier to the customer and the price shall include all credit quality related information that the supplier can see and believe relevant. Suppliers may think of it as a good source of information. So suppliers seem to give credit to the most profitable and least profitable companies.

This suggests that they may have some advantage in lending to a lower credit quality customer that might be denied by financial institutions for lending finance. Why do suppliers seem eager to provide trade credit to companies which do not receive capital from financial institutions? As mentioned earlier, one reason may be that unprofitable companies may not be remaining in the future. By investing in relationships with companies that are unprofitable today, suppliers may capture future earnings from the company. Lending to these seemingly high-risk companies, suppliers can invest in the future viability and profitability of their clients.

Asset turnover is an important ratio for the purpose of management efficiency. Asset turnover used to measure the revenue generated through the use of assets. It shows the company's ability to generate more revenue. The asset turnover based on Koh & Amherst (2017) shows how much assets the company has used to generate revenue. A higher value of the asset turnover indicates that the company has effectively used the asset against the sale. Asset turnover shows that the resulting assets have a significant impact on trade credit contracts for both receivables and payables. Higher asset turnover suggests more trade credit will be available. According to Fairfield and Yohn (2001) the change in asset turnover predicts the company's future profitability. The researchers also believe that investors and analysts must check the changes in asset turnover as they demonstrate the company's future profitability.

According to Shaheen and Y.Javid (2014), the credit rating is a tool that assesses the opportunity investors receive interest on debt and principal repayments in the relevant contract issued by the borrower. Beaver (1966) uses the financial ratios such as cash flow ratio, profitability ratio, liquidity ratio and turnover ratio in the financial statements to forecast the financial statements of the previous year before the bankruptcy. To keep the data balanced, they took the asset size and data from both failed and failed companies in the same industry.

Bissoondoyal-Bheenick (2005) used the firm's financial ratios to test the quantitative determinants of credit ratings. The main findings show that profitability, size and leverage ratio has an impact on the predicted credit rating. Further results

also show that early evidence of the impact of changes in ratings suggests that only the impact of a credit rating downgrade on markets cannot be applied to all credit rating agencies.

Rashid and Abbas (2011) conducted a study to predict the bankruptcy of Pakistani non-financial sector. They use 24 financial ratios to measure the company's financial characteristics, such as, checking profitability, liquidity, leverage, and turnover during the five years before bankruptcy. They say that financial ratios are very important for the prediction of bankruptcy in 1996 and 2006. Discriminant analysis generated sales of total assets, EBIT and current liabilities, and cash flow ratios. Their results show that "firms with Z below zero fall into" bankruptcy, "and firms with Z above zero fall into the category of" non-bankrupt. In addition, when the model is applied to predict bankruptcy, the prediction accuracy reaches 76.9%.

Shaheen and Y.Javid (2014) find that the positive correlation between company size and credit rating suggests that firm size is a key determinant of credit rating. and Alali et al., (2012). These results also support the signaling theory that larger companies have higher credit ratings because larger credit-size companies have higher expected future cash flows and are strong enough to face financial distress and bankruptcy.

Compared with other studies e.g. (Petersen and Rajan, 1997), smaller companies have expanded their trade credit as a part of sales. This is due to the fact that small business customers may be smaller, need trade finance, or small businesses tend to be more knowledgeable about customers, more capable and motivated to collect receivables and therefore more willing to expand trade credit (Cull, Xu and Zhu, 2008). According to Diamond (1989), Rajan, Zingales (1995), Akhtar, Javed and Maryam and Sadia (2012), young and medium-sized enterprises have access to trade credit more and lessen chances to get bank loan but large companies have convenient access to bank loans.

## **2.1 Theories of Trade Credit**

### **2.1.1 Liquidity Theory**

Trade credit can also be used for liquidity motives. When there is limited access of financing to the client or when suppliers have better access of finance than the client, so trade credit follows. Trade credit is the oldest type of financing accessible for the buyers by suppliers (Emery, 1987). According to this theory, trade credit suppliers have direct advantages over other financiers. One of the most advantages is that suppliers are in a direct contact to their clients or buyers and easily evaluate and monitor credit worthiness of their clients. Besides this, suppliers have a fast and effective way of liquidating their assets in trade credit than other institutional financiers. The perspective of this liquidity theory is buyer opportunism as firstly note by Peterson and Rajan (1997). According to Wilner (2000) the purpose of trade credit evidently shows liquidity motives for buyers and suppliers. The preceding studies of Evan (2000) state that trade credit offered by suppliers are more profitable for supplier even in financial distress. Suppliers grant more concessions to buyers when there is distress in financial market and thus it should be marked as advantages for buyers. The findings of Petersen and Rajan (1997), and Evan (2000) further propose that seller opportunism also exists in trade credit where as buyers are dependent on suppliers (trade creditors).

### **2.1.2 Asymmetric Information Theory**

Information about buyers or borrowers always depends upon the assessment of credits. In most of the cases lenders do not have the thorough knowledge and information about their customers, and thus cause difficulties in assessment of credit worthiness by lenders. Similarly, buyers also do not know about the good quality of lenders or suppliers products and may cause a loss. Hence there are two views, the first one is that it has cost advantage for both buyers and lenders as earlier discussed. From lenders point of view, they have very less information about the buyers or borrower as compared to credit suppliers. Information about

buyers or borrower is necessary for credit and supplies, and hence suppliers have traditionally better advantages in trade credit due to strong informative relations (Schwartz, 1974 and Willaimsom 1981).

In the second view, trade credits have a cost advantage for both supplier and buyers but may cause a problem of product quality for buyers. The problem is pointed by Smith (1987), he refers that trade credit maintains in firms only if they maintain the quality of the products. Many studies refer that trade credits are more in those industries where quality of products is low. As like Lee and Stowe (1993), and Deloof and Jegers (1996) studied trade credit. On this point of view, they suggest that sellers pass low quality goods on high cost in trade credit. According to Long Malitz and Ravid (1993), and Wei and Zee (1997) large firms sell products of low quality on trade credit as compared to small firm because small firm have a more thinking of its reputations. These studies further suggest that in trade credit many industries cheat information about quality of the products.

### **2.1.3 Macroeconomic Conditions**

The impact of macroeconomic situation on trade credit use cannot be ignored and highlighted by many researches. Smith (1987) argues that account receivables settled according to the economic situation. The use of trade credit has increased with the deteriorating gross domestic product (Niskanen & Niskanen, 2006). As discussed by Ahmed, Xiaofeng & Mujtaba (2014), the relationship between GDP and the economy is negatively correlated. According to Smith (1987) states that suppliers have informational advantages over banks. Trade credit has been extended if state conditions are not stable and increased borrowing has made trade credit a viable short-term fund.

According to Smith (1987), the uncertain product market can form a complete theory because suppliers have complete information superiority to banks in terms of product quality at the buyer's and customer's standards. Due to the informational interests, the supplier can shield the buyer from many types of risks. Credit

scrutiny has been processed and the quality of the borrower is screened by indicating the liquidity or leverage ratio to reduce the information asymmetry between the lender and the borrower.

Vaidya, R.R. (2012) suggest that there is strong evidence in India that support the inventory management incentives for trade credit. Businesses are trying to increase sales and cut finished product inventories by providing trade credits or on net basis. When stock of inventory piles up company tends to delay payments to suppliers it shows higher accounts payable on books. This is likely to help companies through the negative influence of sales. As a result, trade credits can generally be viewed as a financial response to the variable demand for finished goods.

#### **2.1.4 Inventory Management Model**

Inventory management model explained that liquidity problem is not problem for large size firms. Large enterprises also have low storage cost. As Long et al., (1993) large firms have a good reputation and due to this fact they can easily access funds. According to Ahmed, Xiaofeng and Mujtaba (2014) large companies do not need to provide assurance for their products.

Large enterprises also have low storage costs. As Long et al. (1993), big business has a good reputation, they have ability to easily access financing due to this fact. According to Ahmed, Xiaofeng and Mujtaba (2014) large companies do not need to provide assurances for their products. Companies that have already given discounts say that businesses that have late payments or fines have shown higher credit costs. Late payment has been a warning for the seller that the buyer may not be able to pay him for the next due payment, ultimately increasing the default risk. The seller is well aware of the sunk costs in the relationship with the buyer and collects the information about buyer's financial position in presence risky customers. The inventory management model developed by Bougheas (2009) shows that firms facing liquidity problems offer more trade credit to customers to increase their receivables as their assets.



## 2.2 Hypotheses Development

On the basis of given literature and theories study tried to develop the following hypotheses.

### 2.2.1 Size (SZ)

Enterprises of different sizes have different determinants of capital structure. Companies that have already made credit transactions do not need to guarantee the product, but also ensure that the reputation between the supplier and the buyer makes the business stronger than before and leads to the scenario that bigger the firms, the more credit they can get (Long 1993). According to Petersen and Rajan (1997), large companies are giving more trade credit because these companies hold large amounts of accounts payable. The larger the company, the more opportunities for managing and properly managing the mechanism so that analysts can make more reliable transactions and records, as well as a large number of trading floor. These aspects led to the company's huge financing. Big companies have an impact on profitability when they leverage their market power.

Large enterprises have the lowest bankruptcy costs and the liquidation attached in the operations is also low, as firm size has a positive impact on performance and trade credit. According to Peterson and Rajan (1997), better quality companies gain more trade credit. Dell, Laevena & Marquez (2014) point out that large company has a more diversified portfolio and a lower risk profile. Small businesses do not have any collateral so they cannot repay their debt and face solvency problems. The size of the company is directly related to the supply of trade credit. The larger the company, the more the company needs for the supply of goods.

**H1a:** There is a significant relationship between large firm size and trade credit.

**H1b:** There is a significant relationship between small firm size and trade credit.

### 2.2.2 Credit rating (CR)

A company's credit rating reflects the view of rating agency about the entity's overall credibility and ability to meet its financial obligations (S & P 2002). According to Shaheen and Y.Javid (2014), credit rating agencies (CRAs) play a significant role in assessing the firms risk of default. Credit rating agencies evaluate companies based on publicly available information. Credit ratings convey the view of credit rating agencies on the issuer's ability to pay its financial obligations. A good corporate credit rating is seen as a symbol of good quality, financial strength and sound reputation. The firm creditworthiness serves the interests of investors, issuers, intermediaries, borrowers and institutions alike.

Low risk firms are more able to provide trade credit, there will be a positive correlation between credit rating and accounts receivable. That is why the variable has negative coefficient. The Taiwan Corporate credit rating index may have a positive effect on the willingness off trade credit providers, high rating usually have an established reputation, which smaller firms may not yet have( Chou, yang and Lin, 2011).

According to Long et al. (1993) there have always been well-known companies, most of whom have gained credit and the ability to get financial support from other sources that are shifting toward trade credit supply and demand. Shaheen & Y.Javid (2014) pointed out those companies with higher credit ratings signal to financial markets and facility investors financial decisions. Moreover, a higher credit rating shows the management efficiency and good quality of the business.

**H2:** There is a significant relationship between credit rating and trade credit supply and demand.

# Chapter 3

## Methodology

### 3.1 Data Description & Methodology

This fragment of the study presents the data collection mechanism from where the data has collected. Data collected only from non-financial firms of Pakistan and use of methodology to capture the impact of independent variables (sales turnover, Liquid Assets, Inventory turnover, Retained earning, Cost of goods sold and Credit rating) on dependent variables (Trade Credit Supply, and Trade Credit Demand) of Pakistani non-financial firms.

#### 3.1.1 Population

Population of this study consists on non-financial firms of Pakistan, listed on PSX.

#### 3.1.2 Sample

Sample size should be the representative of population. Sample size for this study includes data of those non-financial firms which provide complete information related to this study is the part of this work. The selection of sample is based on the basis of the availability of data according to JCR-VIS and PACRA Credit Rating for non-financial firms. Finally, in this study 22 companies selected according to PACRA and 16 companies selected according to JCR-VIS credit rating agency.

Trade credit deals in non-financial firms due to this the financial firms is not included in working. Both cross sectional and time series data is included in this research and data collected for nine years from the year 2008 to 2016.

List of selected companies according to industry wise has provided in appendix A.

### 3.1.3 Sources of Data

This study based on secondary data, which is already available and ready for use. Sources of secondary data include government and private publications, financial reports of entities, journals, magazines, newspapers, circulars, website of State bank of Pakistan (SBP). Secondary data from annual financial accounts of non-financial firms are used related to trade credit. PACRA and JCR-VIS Credit Rating Agencies websites are used to collect the data related to credit rating data of non-financial firms.

### 3.1.4 Data Analysis ( Credit Rating Process)

- AAA: Credit rating is highest because of risk factor is negligible. It is risk free more than the debt of government.
- AA+, AA, AA-: It has high credit quality due to strong factors of protection but due to the risk of economic condition it is modest. When protection factors are strong but because of economic condition, risk is the modest whoever it may be vary slightly with the passage of time.
- A+, A, A-: It has good quality of credit where its protection factors are suitable and due to the variation in economy risk factors are fluctuating.
- BBB+ BBB, BBB-: In this category, credit quality is satisfactory as factors which protect are enough and reasonable. In case if there is any change in the economy risk factor consider as a variable.

- BB+, BB, BB-: It seems like obligation like to be considering as factor of production have capacity of weakening in case if there is any change in the economy.
- B+, B, B-: Obligation seems to be fulfill if factor of production has capacity to have flexible in case if there is any change in the economy. In this category there is a change of upward or downward movement.
- CCC: In this category there is high level uncertainty towards its obligation where factor of production is risky.
- CC: There is high chance of default risk.
- C: Very risky
- D: It looks towards bankruptcy.

Table 3.1 defines the criteria of credit rating which will be helpful for analysis. Here, weightage to credit rating is assigned for sake of analysis the study used the criteria set by (Shaheen and Yasmin Javid, 2014) in the following manner.

TABLE 3.1: Table of Credit Rating Process

Weightage	Ratings
1	AAA
0.95	AA+
0.9	AA
0.85	AA-
0.8	A+
0.75	A
0.7	A-
0.65	BBB+
0.6	BBB
0.55	BBB-
0.5	BB+
0.45	BB
0.4	BB-
0.35	B+
0.3	B
0.25	B-
0.2	CCC
0.15	CC
0.1	C
0.05	D

### 3.1.5 Descriptive Statistics

Statistical behavior of data is captured by using the descriptive statistics. Descriptive statistics includes mean which provide the average of data, median which divide the data set into two equal segments and it is the mid value of data set, standard deviation provides the information that how much the spread of data from its mean value. Mean and standard deviation must be used together if used separately both will be meaningless. Positive and negative spread of data captured

by using the skewness but kurtosis infers about the flatness of data spread. By using the descriptive statistics we capture the acute inferences of variables.

### 3.1.6 Correlation Analysis

Correlation analysis is used to capture the degree of strength among variables. This tool also deals about the direction of relationship between variables. Correlation analysis among variables indicates positive and negative relationships among different variables. Its range lies from -1 to +1. Low correlation between two variables shows low chances of multicollinearity while high correlations between two variables indicate high chances of multicollinearity.

## 3.2 Econometric Model

### 3.2.1 Panel Data Analysis

Panel data set consists of both time-series data and cross-sectional data, same has been applied to this study. When panel data have the same series of time observations for each cross-section of variable it is known as a balanced panel. When the series of time observations differs among cross-sections the panel is known as an unbalanced panel (Gujarati, 2003). There are three different models used in panel data analysis. Each model has a different assumption for the intercept.

In this study, specifically the model for trade credit can be written as follows:

$$\begin{aligned} (TC)_{it} = & \beta_0 + \beta_1 (Size)_{it} + \beta_2 (CR)_{it} + \beta_3 \left( \frac{Sales}{TA} \right)_{it} + \beta_4 (lnCGS)_{it} \\ & + \beta_5 \left( \frac{INV}{TA} \right)_{it} + \beta_6 \left( \frac{RET}{TA} \right)_{it} + \beta_7 (lnCash)_{it} + \mu_{it} \end{aligned} \quad (3.1)$$

### 3.2.2 Common Coefficient Model

The first model is the common coefficient model. It has a constant intercept across all cross-sections and time periods.

General equation of Common effect model:

$$\gamma_{it} = \alpha_0 + \beta(X)_{it} + \mu_{it} \quad (3.2)$$

where,

$\gamma$  is dependent variable and X is the list of independent variables and  $\mu$  is error term.

Because trade credit has two segment. Here, two equations used to capture the effect of trade credit supply and trade credit demand in this study.

In this study;

Equation for trade credit supply, large firm size and credit rating.

$$\begin{aligned} \left(\frac{AR}{Sales}\right)_{it} &= \beta_0 + \beta_1(LSize)_{it} + \beta_2(CR)_{it} + \beta_3(CR * LSize)_{it} + \beta_4\left(\frac{INV}{TA}\right)_{it} + \\ &\beta_5\left(\frac{Sales}{TA}\right)_{it} + \beta_6\left(\frac{Ret}{TA}\right)_{it} + \beta_7(lnCash)_{it} + \mu_{it} \end{aligned} \quad (3.3)$$

Equation for trade credit supply, small firm size and credit rating.

$$\begin{aligned} \left(\frac{AR}{Sales}\right)_{it} &= \beta_0 + \beta_1(SSize)_{it} + \beta_2(CR)_{it} + \beta_3(CR * SSize)_{it} + \beta_4\left(\frac{INV}{TA}\right)_{it} + \\ &\beta_5\left(\frac{Sales}{TA}\right)_{it} + \beta_6\left(\frac{Ret}{TA}\right)_{it} + \beta_7(lnCash)_{it} + \mu_{it} \end{aligned} \quad (3.4)$$

Equation for trade credit demand, large firm size and credit rating.

$$\begin{aligned} \left(\frac{AP}{Sales}\right)_{it} &= \beta_0 + \beta_1(LSize)_{it} + \beta_2(CR)_{it} + \beta_3(CR * LSize)_{it} + \beta_4\left(\frac{INV}{TA}\right)_{it} + \\ &\beta_5(lnCGS)_{it} + \beta_6\left(\frac{Ret}{TA}\right)_{it} + \beta_7(lnCash)_{it} + \mu_{it} \end{aligned} \quad (3.5)$$



Equation for trade credit demand, small firm size and credit rating.

$$\begin{aligned} \left(\frac{AP}{Sales}\right)_{it} &= \beta_0 + \beta_1(SSize)_{it} + \beta_2(CR)_{it} + \beta_3(CR * SSize)_{it} + \beta_4\left(\frac{INV}{TA}\right)_{it} + \\ &\beta_5(\ln CGS)_{it} + \beta_6\left(\frac{Ret}{TA}\right)_{it} + \beta_7(\ln Cash)_{it} + \mu_{it} \end{aligned} \quad (3.6)$$

### 3.2.3 Fixed Effect Model

The second model is Fixed Effect Model which describes that intercept is different for all cross sections.

General equation of fixed effect model:

$$\gamma_{it} = \alpha_i + \beta(X)_{it} + \dots + \beta_k(X)_{kit} + \mu_{it} \quad (3.7)$$

In this study:

Equation for trade credit supply, large firm size and credit rating.

$$\begin{aligned} \left(\frac{AR}{Sales}\right)_{it} &= \alpha_i + \beta_1(LSize)_{it} + \beta_2(CR)_{it} + \beta_3(CR * LSize)_{it} + \beta_4\left(\frac{INV}{TA}\right)_{it} + \\ &\beta_5\left(\frac{Sales}{TA}\right)_{it} + \beta_6\left(\frac{Ret}{TA}\right)_{it} + \beta_7(\ln Cash)_{it} + \mu_{it} \end{aligned} \quad (3.8)$$

Equation for trade credit supply, small firm size and credit rating.

$$\begin{aligned} \left(\frac{AR}{Sales}\right)_{it} &= \alpha_i + \beta_1(SSize)_{it} + \beta_2(CR)_{it} + \beta_3(CR * SSize)_{it} + \beta_4\left(\frac{INV}{TA}\right)_{it} + \\ &\beta_5\left(\frac{Sales}{TA}\right)_{it} + \beta_6\left(\frac{Ret}{TA}\right)_{it} + \beta_7(\ln Cash)_{it} + \mu_{it} \end{aligned} \quad (3.9)$$

Equation for trade credit demand, large firm size and credit rating.

$$\begin{aligned} \left(\frac{AP}{Sales}\right)_{it} &= \alpha_i + \beta_1(LSize)_{it} + \beta_2(CR)_{it} + \beta_3(CR * LSize)_{it} + \beta_4\left(\frac{INV}{TA}\right)_{it} + \\ &\beta_5(\ln CGS)_{it} + \beta_6\left(\frac{Ret}{TA}\right)_{it} + \beta_7(\ln Cash)_{it} + \mu_{it} \end{aligned} \quad (3.10)$$

Equation for trade credit demand, small firm size and credit rating.

$$\begin{aligned} \left(\frac{AP}{Sales}\right)_{it} = & \alpha_i + \beta_1(SSize)_{it} + \beta_2(CR)_{it} + \beta_3(CR * SSize)_{it} + \beta_4\left(\frac{INV}{TA}\right)_{it} + \\ & \beta_5(\ln CGS)_{it} + \beta_6\left(\frac{Ret}{TA}\right)_{it} + \beta_7(\ln Cash)_{it} + \mu_{it} \end{aligned} \quad (3.11)$$

there are two different tests are used to determine which of the three models should be used for application of panel data analysis.

### 3.2.4 Redundant Fixed effect test

This test plays the role of decision maker between Common and fixed effect model. If the F stat. and Chi-square of cross-section is less than 0.05 than fixed effect model used if P-value is insignificant than common coefficient model will apply.

### 3.2.5 Random Effect Model

In random effect model intercept considered as error term and it do nothing with the cross sections (companies). This model explains the variation among the different companies. It offers following benefits.

- Random effect model has fewer parameters to estimate with comparison to fixed effect model.
- It provides the permission for additional independent variables with same number of observations.

General equation of random effect model:

$$\gamma_{it} = \alpha + \beta_1(X)_{1it} + \beta_2(X)_{2it} \cdots + \beta_k(X)_{kit} + (\nu_i + \mu_{it}) \quad (3.12)$$

Where( above all equations),

Yit is dependent variable like account receivable and account payables, respectively they are used as proxy for trade credit supply and trade credit demand. X is the

list of independent variables. X explanatory variables are as size of firm (dummy) (LSize for large firms and SSize for small firms), assets turnover, inventory and retained earnings, credit rating of non-financial firms, cost of goods sold, and cash.  $i$  represent different firms at time  $t$ .  $u$  represent error term.

### **3.2.5.1 Huasemen Test**

This test used to decide between random and fixed effect model. If the F stat. and Chi-square of cross-section is less than 0.05 than fixed effect model is used if P-value is insignificant than common random effect model is applied.

### 3.2.6 List of Variables

TABLE 3.2: Variables List

Variable	Name	Measurement	Sources
DV	Trade Credit Supply	(Accounts receivable/Sales)	Oh & Kim (2016)
	Trade Credit Demand	(Accounts payables/ Sales)	
IV	Credit Rating	AAA=1 to D=0.05	Chou, Yang & Lin (2011)
Control V's	Asset Turnover	Sales/ Total assets	Fairfield and Yohn (2001)
	Cash	Ln (cash and cash equivalents	Chou, Yang & Lin (2011)
	Inventory	Inventory/ Total assets	Carpenter, Fazzari & Petersen 91994)
	Retained earnings	Retained earnings/ Total assets	Fabbri & Klapper (2008)
	Cost of goods sold	Ln (Cost of goods sold)	Chou, Yang & Lin (2011)
	Firm size	Total assets (Dummy 1=large, 0=small)	Chou, Yang & Lin (2011)

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Trade credit supply is measured as accounts receivable to sales. Trade credit demand is measured as accounts payable to sales. Assets turnover is measured as a sales to total assets. Availability of cash as liquid asset, measured as natural log of cash and cash equivalent. Inventory is measure of inventory to total assets. Retained earnings are measure of retained earnings to total assets. Cost of goods sold is measure as natural log of cost of goods sold. Size is the measure of firm power in market. Here, dummy of firm size(total assets based) is created for large and small firms. Here, dummy 1 for large and 0 for small size firm and vice versa.

# Chapter 4

## Results and Discussion

### 4.1 Descriptive Statistics

Table 4.1 shows the descriptive statistics of all variable which are used in this study, the mean value of account receivable to sales is 0.180 and its standard deviation is 0.296. Account receivable to sales is used as proxy for trade credit supply. The maximum and minimum are 2.811 and 0.001. The average value of account payable to sales is 0.207 with the maximum and minimum of 5.271 and 0.008. Account payable is used as proxy of trade credit demand. Its standard deviation is 0.458. The mean value of CR is 0.799 and its standard deviation is 0.131. Its maximum and minimum are 1 and 0.050. The results show that maximum credit rating is AAA and minimum credit rating is D. The mean of sales to assets is 1.017 with maximum and minimum 2.948 and 0.194. Its standard deviation is 0.567. The mean of CGS is 9.466 with the maximum and minimum value of 13.805 and 2.782. Its standard deviation is 1.587. The mean value of inventory to assets is 0.153 with maximum and minimum value of 0.561 and 0.0007. Its standard deviation is 0.193. The mean value of retained earnings to assets shows the mean value of 0.303 with maximum and minimum of 0.769 and 0.0003 and its standard deviation is 0.409. The mean value of cash is 5.729 with the maximum and minimum of 9.849 and 0.1337 and its standard deviation is 2.506.

TABLE 4.1: Descriptive Statistics

	<b>ACR</b>	<b>ACP</b>	<b>CR</b>	<b>A.T</b>	<b>CGS</b>	<b>INV</b>	<b>RET</b>	<b>Cash</b>
Mean	0.180	0.207	0.799	1.017	9.466	0.153	0.303	5.729
Median	0.084	0.132	0.800	0.999	9.503	0.107	0.222	5.332
Maxi.	2.811	5.271	1.000	2.948	13.805	0.561	0.7690	13.463
Mini.	0.001	0.008	0.050	0.194	2.782	0.0007	0.0003	0.1337
Std.Dev.	0.296	0.458	0.131	0.567	2.782	0.193	0.409	2.506

## 4.2 Correlation Matrix Analysis

Table 4.2 enlighten the relationship among variables. Pearson correlation test adopted to explain the direction and strength of the relationship. Correlation between Asset turnover and trade credit supply is positive. It means both variables move in same direction. Correlation shown between inventory and trade credit supply is negative. Credit rating shows the positive relationship with trade credit supply. Retained earnings, liquidity, inventory and cost of goods sold show negative relationship with trade credit supply. Credit rating, sales and liquidity shows positive relationship with accounts payable. But inventory, retained earnings and cost of goods sold have a negative relationship with accounts payable. Asset turnover, liquidity, retained earnings and cost of goods sold show positive but inventory shows a negative relationship with credit rating. Liquidity, inventory, retained earnings and cost of goods sold have a positive relationship with asset turnover. Inventory and retained earnings have negative but cost of goods sold has a positive relationship with liquidity. Retained earnings and cost of goods sold have a positive relationship with inventory. Retained earnings and cost of goods sold have positive relationship.

TABLE 4.2: Correlation Matrix Analysis.

	ACR	ACP	CR	A.T	Cash	INV	RET	CGS
ACR	1							
ACP	0.4050	1						
CR	0.1139	0.0586	1					
A.T	0.0860	0.1186	0.1225	1				
LIQ	-0.0806	0.0874	0.3375	0.1223	1			
INV	-0.1423	-0.0532	-0.0065	0.6909	-0.0287	1		
RET	-0.0880	-0.0818	0.0957	0.5767	-0.0236	0.6609	1	
CGS	-0.1335	-0.0943	0.2937	0.2109	0.6514	0.0795	0.0134	1

### 4.3 Panel Unit Root Test

Presence of unit root provides the biased results and may be present in the panel data set due to the large number of observations. Unit root test based on the assumption whether there is any restriction on data series or not. In this study we have used different measures to detect the unit root in the data set. We have used Levin, Lin and Chu (2002) and Im, Pesran and Shin (2003). The results of unit root test are reported in the following Table 4.3. Results reported are indicating that unit root does not exist in any of the variable or the series are stationary at level.



TABLE 4.3: Panel Unit Root Test.

Variables	Levin, Lin & Chu $t^*$		Im, Pesaran and Shin W-stat	
	Statistic	Prob.	Statistic	Prob.
ACR	-31.6392	0.0000	-3.88869	0.0001
A.T	-91.5806	0.0000	-15.0329	0.0000
RET	-14.7395	0.0000	-2.93404	0.0017
INV	-36.5333	0.0000	-8.48959	0.0000
Cash	-34.8231	0.0000	-6.26292	0.0000
ACP	-99.0661	0.0000	-13.2877	0.0000
CGS	-6.92195	0.0000	-2.66970	0.0038

### 4.3.1 Result of Hausmen Fixed Effect Test

The hausmen fixed effect test of trade credit supply and trade credit demand for the period of 2008 to 2016. Redundant fixed effect test applied for selection between common and fixed effect model. The p-value of cross-section F and Chi-square is (0.0000). Which is less than 0.05 so fixed effect model is appropriate.

The hausmen test is applied to decide between fixed effect and random effect model. The p-value of cross-section random is (0.0087). In case of trade credit demand, the p-value of cross-section random is (0.0005). It also indicating that fixed effect model will be applied.

### 4.3.2 Effect of Credit Rating on Trade Credit Supply

Table 4.4 explains the relationship between credit rating and trade credit supply for large size firms. In this model asset turnover (AT), retained earnings (RET), cash and bank balance (Cash) inventory (INV) as control variable. Large size firms have coefficient value is (1.0331) their p-value is (0.0469) significant which is less at the level of ( $p \leq 0.05$ ). It means large size firms offer more trade credit to

their customers. A credit rating of firms have significant p-value (0.0350) with its coefficient value (1.3926). It means when credit rating of firms increase, it leads to increase in trade credit supply by firms. The result of interaction term (combine effect of firm size and credit rating) (LSIZE\*CR) show that its p-value is (0.0296) significant and coefficient values is (-1.4302). It indicates if 1 percent variation occurs in credit rating, trade credit supply by large firms will change -1.4302 in apposite directions. It means large firms offers less trade credit to other firms because they have no liquidity problem. So according to research objective (LSize\*CR) the combine effect of credit rating and size on trade credit is negative.

The p-value of asset turnover is significant at the level of ( $p \leq 0.05$ ) coefficient value is (0.0683). It implies that trade credit supply and sales move in same direction. When sales increase, trade credit also increases. So, third hypothesis is accepted. Retained earnings has negative coefficient value (-0.3776) with p-value is (0.0000) which is significant. It means firms use external finance only when internal funds are insufficient.

Inventory to assets ratio has a positive coefficient (0.4519) with p-value is (0.0307) which is significant. As the firm piles up inventory, they become more able to offer trade credit and thus offer to companies that have suffered a negative impact on sales. Inventory management is thus an important motive for firms to offer the trade credit to other firms.

The R-squared value shows that 58.38% of variation occurred in trade credit (dependent variable) are explained by independent variables credit rating.

TABLE 4.4: Effect of Credit Rating on Trade Credit Supply (Large Size Firms)

Variables	Fixed Effect			Random Effect			Common Effect		
	Coefficient	t-statistic	Prob.	Coefficient	t-statistic	Prob.	Coefficient	t-statistic	Prob.
C	-0.8547	-1.6351	0.1035	-1.0235	-2.6156	0.0094	-0.6994	-2.2956	0.0225
LSIZE	1.0331	1.9987	0.0469	1.1845	2.9617	0.0034	0.8790	2.6753	0.0080
CRL	1.3926	2.1216	0.0350	1.6192	3.2730	0.0012	1.2868	3.2831	0.0012
LSIZE*CRL	-1.4302	-2.1906	0.0296	-1.5663	-3.1055	0.0021	-1.0983	-2.6687	0.0081
Asset turnover	0.0683	3.5342	0.0005	0.0740	4.3406	0.0000	0.0795	4.6383	0.0000
RET	-0.3776	-4.4124	0.0000	-0.2405	-3.4568	0.0006	-0.1082	-1.8015	0.0728
INV	0.4519	2.1759	0.0307	0.0401	0.2322	0.8165	-0.4477	-3.0732	0.0024
LIQ	-0.0091	-0.8013	0.4238	-0.0112	-1.1891	0.2355	-0.0254	-2.8771	0.0044
R-squared			0.5838			0.1255			0.1469
Adj.R-squ			0.5002			0.1010			0.1230
F-statistic			6.9815			5.1250			6.1475
Prob(F-statistic)			0.0000			0.0000			0.0000
Durbin-Wat stat			1.6869			1.3764			0.9362

### 4.3.3 Effect of Credit Rating on Trade Credit Supply

Relationship between Credit Rating and Trade Credit supply for Small-sized firms is explained in table 4.5. In this model asset turnover (AT), retained earnings (RET), cash and bank balance (Cash) inventory (INV) as control variable. Small-size firms have coefficient value is (-1.0331) their p-value is (0.0469) significant which is less at the level of ( $p \leq 0.05$ ). It means, there is a positive relationship between trade credit supply and small firms size. A credit rating of firms has negative coefficient value (-0.0376) with its p-value (0.8290) is insignificant. The result of interaction term (combine effect of firm size and credit rating) (SSIZE\*CR) show that its p-value is (0.0296) significant and coefficient values is (1.4302). It means small sized firms are more interested in trade credit. It means small firms offers more trade credit to their customers. So according to research objective (SSize\*CR) the combine effect of credit rating and size on trade credit is positive.

The p-value of asset turnover is significant at the level of ( $p \leq 0.05$ ) coefficient value is (0.0683). It implies that trade credit supply and sales move in same direction. When sales increase, trade credit also increases. So, third hypothesis is accepted. Retained earnings has negative coefficient value (-0.3776) with p-value is (0.0000) which is significant. It means firms use external finance only when internal funds are insufficient.

Inventory to assets ratio has a positive coefficient (0.4519) with p-value is (0.0307) which is positive and significant. As the company piles up inventory, they become more able to offer trade credit and thus offer to companies that have suffered a negative impact on sales. Inventory management is thus an important motive for firms to offer the trade credit to other firms.

The R-squared value shows that 58.38% of variation occurred in trade credit (dependent variable) are explained by independent variables Credit Rating.

TABLE 4.5: Effect of Credit Rating on Trade Credit Supply (Small Size Firms)

Variables	Fixed Effect			Random Effect			Common Effect		
	Coefficient	t-statistic	Prob.	Coefficient	t-statistic	Prob.	Coefficient	t-statistic	Prob.
C	0.1784	1.1421	0.2547	0.1610	1.1584	0.2478	0.1795	1.4889	0.1378
SSIZE	-1.0331	-1.9987	0.0469	-1.1845	-2.9617	0.0034	-0.8790	-2.6753	0.0080
CR	-0.0376	-0.2163	0.8290	0.0529	0.3361	0.7371	0.1885	1.2614	0.2084
SSIZE*CR	1.4302	2.1906	0.0296	1.5663	3.1055	0.0021	1.0983	2.6687	0.0081
Asset Turnover	0.0683	3.5342	0.0005	0.0740	4.3406	0.0000	0.0795	4.6383	0.0000
RET	-0.3776	-4.4124	0.0000	-0.2405	-3.4568	0.0006	-0.1082	-1.8015	0.0728
INV	0.4519	2.1759	0.0307	0.0401	0.2322	0.8165	-0.4477	-3.0732	0.0024
LIQ	-0.0091	-0.8013	0.4238	-0.0112	-1.1891	0.2355	-0.0254	-2.8771	0.0044
R-squared			0.5838			0.1255			0.1469
Adj.R-squ			0.5002			0.1010			0.1230
F-statistic			6.9815			5.1250			6.1475
Prob(F-statistic)			0.0000			0.0000			0.0000
Durbin-Wat stat			1.6869			1.3764			0.9362

#### 4.3.4 Effect of Credit Rating on Trade Credit Demand

Table 4.6 explains the relationship between credit rating and trade credit demand for large sized firms. In this model asset turnover (CGS), retained earnings (RET), cash (Cash) inventory (INV) as control variable. Large size firms have coefficient value is (1.5245) with p-value is (0.0800) significant which is significant at the level of ( $p \leq 0.10$ ). It means large size firms and trade credit demand have positive relationship. A credit rating of firms has significant p-value (0.0693) with its coefficient value (2.0408). It means when credit rating of firms increase, it leads to increase in trade credit demand by firms. The result of interaction term (combine effect of firm size and credit rating) (LSIZE\*CR) show that its p-value is (0.0587) significant and coefficient values is (-2.0954). It indicates if 1 percent variation occurs in credit rating, trade credit supply by large firms will change -2.0954 in opposite directions. It means large firms are less involved in trade credit demand. So according to research objective (LSize \*CR) the combine effect of credit rating and size on trade credit is negative.

Retained earnings has negative coefficient value (-0.6117) with p-value is (0.0000) which is significant. It means firms use external finance only when internal funds are insufficient. Inventory to assets ratio has a positive coefficient (1.4604) with p-value is (0.0000) which is significant. Inventories are easy to liquidate from suppliers point of view. So when this ratio is high, suppliers have advantage over financial institutions and he will be willing to offer trade credit.

The R-squared value shows that 39.68% of variation occurred in trade credit (dependent variable) are explained by independent variables Credit Rating.

TABLE 4.6: Effect of Credit Rating on Trade Credit Demand (Large Size Firms)

Variables	Fixed Effect			Random Effect			Common Effect		
	Coefficient	t-statistic	Prob.	Coefficient	t-statistic	Prob.	Coefficient	t-statistic	Prob.
C	-0.6179	-0.6688	0.5043	-0.2699	-0.4708	0.6382	0.3218	0.6756	0.4999
LSIZE	1.5245	1.7587	0.0800	0.8965	1.5259	0.1283	0.2992	0.5892	0.5562
CRL	2.0408	1.8257	0.0693	1.2514	1.7428	0.0826	0.4786	0.7886	0.4311
CRL*LSIZE	-2.0954	-1.9003	0.0587	-1.0904	-1.4729	0.1420	-0.2556	-0.4019	0.6881
CGS	-0.0861	-2.5993	0.0100	-0.0842	-3.6148	0.0004	-0.0921	-4.4400	0.0000
RET	-0.6117	-4.1645	0.0000	-0.2879	-2.7569	0.0063	-0.1419	-1.5412	0.1245
INV	1.4604	4.1595	0.0000	0.6253	2.6256	0.0092	0.2286	1.1419	0.2546
LIQ	0.0163	0.6865	0.4931	0.0512	2.6208	0.0093	0.0627	3.4433	0.0007
R-squared			0.3968			0.0699			0.0881
Adj.R-squ			0.2784			0.0444			0.0630
F-statistic			3.3505			2.7391			3.5178
Prob(F-statistic)			0.0000			0.0093			0.0013
Durbin-Wat stat			1.6332			1.0778			1.1628

#### 4.3.4.1 Effect of Credit Rating on Trade Credit Demand

Table 4.7 explains the relationship between credit rating and trade credit demand for Small-sized firms. In this model asset turnover (AT), retained earnings (RET), cash and bank balance (Cash) inventory (INV) as control variable. Small-size firms coefficient value is (-1.5245) their p-value is (0.0800) significant at the level of ( $p \leq 0.10$ ). It means, there is a positive relationship between trade credit demand and small-sized firms. A credit rating of firms has negative coefficient value (-0.0547) with its P-value (0.8639) is insignificant. The result of interaction term (combine effect of firm size and credit rating) (SSIZE\*CR) show that its p-value is (0.0587) significant and coefficient values is (2.0954). It means small sized firms are more interested in trade credit. It means small firms demand more trade credit. So according to research objective (SSize \*CR) the combine effect of credit rating and size on trade credit is positive.

Retained earnings has negative coefficient value (-0.6117) with p-value is (0.0000) which is significant. It means firms use external finance only when internal funds are insufficient. Inventory to assets ratio has a positive coefficient (1.4604) with p-value is (0.0000) which is significant. Inventories are easy to liquidate from suppliers point of view. So when this ratio is high, suppliers have advantage over financial institutions and he will be willing to offer trade credit.

The R-squared value shows that 39.68% of variation occurred in trade credit (dependent variable) are explained by independent variables Credit Rating.



TABLE 4.7: Effect of Credit Rating on Trade Credit Demand (Small Size Firms)

Variables	Fixed Effect			Random Effect			Common Effect		
	Coefficient	t-statistic	Prob.	Coefficient	t-statistic	Prob.	Coefficient	t-statistic	Prob.
C	0.9066	2.3832	0.0180	0.6266	2.4019	0.0170	0.6210	2.7797	0.0058
SSIZE	-1.5245	-1.7587	0.0800	-0.8965	-1.5259	0.1283	-0.2992	-0.5892	0.5562
CRL	-0.0547	-0.1716	0.8639	0.1611	0.6212	0.5350	0.2230	0.9490	0.3435
CRL*SSIZE	2.0954	1.9003	0.0587	1.0904	1.4729	0.1420	0.2556	0.4019	0.6881
CGS	-0.0861	-2.5993	0.0100	-0.0842	-3.6148	0.0004	-0.0921	-4.4400	0.0000
RET	-0.6117	-4.1645	0.0000	-0.2879	-2.7569	0.0063	-0.1419	-1.5412	0.1245
INV	1.4604	4.1595	0.0000	0.6253	2.6256	0.0092	0.2286	1.1419	0.2546
LIQ	0.0163	0.6865	0.4931	0.0512	2.6208	0.0093	0.0627	3.4433	0.0007
R-squared			0.3968			0.0699			0.0881
Adj.R-squ			0.2784			0.0444			0.0630
F-statistic			3.3505			2.7391			3.5178
Prob(F-statistic)			0.0000			0.0093			0.0013
Durbin-Wat stat			1.6332			1.0778			1.1628

# Chapter 5

## Conclusion

### 5.1 Conclusion

Trade credits, buyer and supplier contracts, trade credit is the best for short-term financing. Importance of trade credit has extended to a new era. Businesses get the best out of resources to get the best potential for their working system and trade credit to fulfill this purpose effectively and efficiently for business. As customers became risky due to a lack of finance and were unable to run their business smoothly, they turned to trade credit agreements with suppliers. Short-term businesses avail trade credit financing because it is best in their mutual interest.

This research study strives to capture the impact of credit rating on trade credit supply and demand. Past research has explained much about trade credit, but there is no such thing as the effect of credit rating on trade credit as per non-financial firms of Pakistan are concerned. Therefore, the study examined the impact of credit ratings on trade credit usage to provide enhanced picture of trade credit. Trade credit contracts give the ultimate way of business operation. On the other hand, the buyer has the advantage of not facing any discomfort as the supplier is already involved in the same business and can make direct use of the supplier credit facilities. bank loans becomes complex, and loan collateral can be

troublesome for the buyer. Risky buyers have a better chance of using discounted loans from the same supplier already involved in the supply of goods.

This study explored the effect of credit rating on trade credit of non-financial firms of Pakistan. 38 non financial firms annual financial data for the period of 9 years (2008 to 2016) has been used for analysis purpose. Trade credit plays an important role for firms as source of finance. Those firms that are financially constrained, they can get the funds in the form of trade credit from supplier to maintain their business operation. Those firms that have higher credit rating they can get supplies on cash. Creditworthy firms financially less constrained as result they can get finance from the formal financial institutions like bank. Small non-firms are more interested in trade credit. Small firms have financial limitations. Therefore they use the trade credit as an alternative of financial source.

### **5.1.1 Policy Recommendations**

Based on these empirical evidences, it is need of the time for legislative authority to improve the mechanism of trade credit and to encourage the small firms that are involved in trade credit. This empirical finding also subsidizes some significant practical policy implication. It provides basic guidelines for policy makers to develop and encourage the trade credit Channel. It is also helpful to enhance and promote the trade credit in our economy and build trust and better customer relationships, and discourage the conventional mechanism.

### **5.1.2 Limitations**

Although this empirical study has many practical implementations. But this study also has same limitation and unobserved factor. First this study only takes into account non-financial firms which are listed at Pakistan stock exchange that public their financial information regular basis. Furthermore, this study only limited to non-financial sector of Pakistan. And results cant be generalized over all Pakistani industries.

### **5.1.3 Future Direction**

This study is based on limited to the selected developing country (Pakistan). It recommended that many other countries should be selected for trade credit and credit rating. So the study uses the annual data of non-financial firms for the effect of credit rating on trade credit and also countries can be used for future research.

The time frame for research work, include the nine years from 2008 to 2016, this time period can be increased by nine years for more accurate results. The empirical support for research in the context of Pakistan has inspired further innovations in research in this area and can be applied to other countries.

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# Appendix-A

TABLE 5.1: Appendix A

Serial No.	Company Name	Industry
1	Fazal Cloth Mills Limited	Textile
2	Nishat Mills Limited	Textile
3	Prosperity Weaving Mills Ltd.	Textile
4	Ibrahim Fibers Ltd.	Polyester
5	Al-Abbas Sugar Mills Ltd.	Sugar Industry
6	Fatima Fertilizer Company Ltd.	Fertilizer
7	Maple Leaf Cement Factory Ltd.	Cement Industry
8	Nishat Power Ltd.	Power Industry
9	SSGCL	Oil & Gas
10	Hum Network Ltd.	Communication
11	PNSCL	Shipping
12	Attock Refinery Ltd.	Oil & Gas
13	National Refinery Ltd.	Oil & Gas
14	Pakistan State Oil Company Ltd.	Oil Marketing Companies
15	Pak Elektron Limited	Household Appliances
16	Ittehad chemicals Ltd.	Chemicals & Pharma
17	Sitara Chemicals Industries Ltd.	Chemicals & Pharma
18	National Foods Limited	Consumer Goods
19	Hascol Petroleum Ltd.	Oil & Gas
20	Treet Corporation Ltd.	Consumer Goods
21	OGDCL	Oil Marketing Companies
22	Century Paper & Board Mills Ltd.	Paper Industry
23	K-Electric Limited	Power industry (electricity)
24	Kot Addu Power Co. Ltd.	Power industry
25	Al-Noor Sugar Mills Ltd.	Sugar
26	JDW Sugar Mills Ltd.	Sugar
27	Shahmurad Sugar Mills Ltd.	Sugar
28	Indus Dyeing & Manufacturing Co Ltd.	Textile
29	Sapphire Textile Mills Limited	Textile
30	Engro Corporation	Holding Company
31	Engro Food	Consumer Goods
32	Pakgen Power Limited	Power
33	TPL Trakker Limited	Tracking Services
34	SNGPL	Gas Utilities
35	Saif Power Limited	Power
36	Lalpir Power limited	Power
37	Kohinoor Energy Limited	Power
38	Descon Oxychem Limited	Hydrogen Peroxide