Impact of Trade Credit on Sales Growth: An Empirical Study Based on Cement Sector of Pakistan

Muhammad Aslam*, Rana Tanveer Hussain1

Abstract
Trade credit management is considered very important in the field of finance for most of the firms. This study throws light on the management of current assets and current liabilities in relation to the trade credit. Trade credit has been a growing source of finance of industrial sector in Pakistan. In this study, the main aim is to analyze the role of trade credit in upgradation of cement sector. To achieve this object, data was taken from the annual financial reports of 17 firms listed cement sector in Pakistan Stock Exchange (PSX). The analyses have been carried out by using the data of 8 years, starting from year 2007 to 2014. Apparently not much work has been done to find out the success or failure of the business units selling cement on credit terms under market conditions prevailing in Pakistan. It was interesting to study the relation of trade credit and sales growth with respect to a developing nation like Pakistan. Panel data (fixed effect) model was used for the estimation of results decided on the basis of Hausman test. In addition to use of trade credit as independent variable, control variables (age, size and lagged sales growth) were also added in the model. Findings of the study show that trade credit has very significant positive affect on sales growth of the firms proclaiming the recommendation for the use of trade credit to enhance the revenues.

Keywords: Trade Credit, Sale Growth, Cement Sector, Pakistan Stock Exchange (PSX).

1. Introduction
Pakistan has numerous industrial sectors. One of these cement sector which is considered as the important industry in the country like Pakistan. Pakistan has also contained bulk of raw material related to cement sector. Private sector is contributing a lot in the production of cement industry. The cement industry of Pakistan is also generating the precious foreign reserve by exporting its related products to nearby countries like India, United Arab Emirates, Afghanistan Russia and Iraq. The demand of cement of Pakistan has been increasing vigorously both at domestic and international markets during the last few decades. Pakistan has also successfully captured the African countries.

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1 School of Commerce & Accountancy, Minhaj University Lahore, Pakistan
* Corresponding Author: aslam.sca@mul.edu.pk
Trade credit management is considered very important in the field of finance for most of the firms. This study throws light on the management of current assets and current liabilities in relation to the trade credit. Trade credit has been growing source of finance of industrial sector in Pakistan. So in this study the main aim is to analyze the role of trade credit in upgradation of cement sector. Trade credit, like other components of working capital, has received little attention in the literature. Especially, for a country like Pakistan there is no separate study on trade credit, rather most of the studies are related to the working capital management. Trade credit is a common transaction method among all the small and medium sized enterprises (Petersen & Rajan, 1995; Peel, Wilson, & Howorth, 2000). Trade credit is a mutual arrangement between two parties to deferral payment allowing the purchasers to purchase goods on account (without paying cash on delivery), paying the seller at a later date. The buyer regards this as a short term liability on the liability side of the balance sheet (Mian & Smith, 1992). From the supplier’s viewpoint, the agreement is considered an investment in current assets in terms of accounts receivable on the asset side of the balance sheet. Trade credit gives more advantage to supplier if the buyer does not make payment within the discount period. The supplier earns more return than purchaser, as the later must pay the cost of capital financing (Martínez-Sola, García-Teruel, & Martínez-Solan, 2014). However, like other investments, investment in account receivable involves great risk and return which may affect the firm performance and value (Pike & Cheng, 2001). There is optimal credit level if the marginal income from investment in account receivable equals its marginal cost (Emery, 1984). Subsequently, firms can improve their performance by giving trade credit (Deloof, 2003).

According to previous researches there are three dimensions of trade credit. The first dimension is focusing on the demand side, the second one is placing more emphasis on the supply side of trade credit (Deloof & Jegers, 1999; Ng, Smith, & Smith, 1999; Petersen & Rajan, 1994, 1995; Pike, Cheng, Cravens, & Lamminmaki, 2005; Wei & Zee, 1997). The third side throws light over the both aspects of trade credit (Petersen & Rajan, 1997).

The main focus of current study is based on the supply side, examining the effect of trade credit in terms of accounts receivable as a current investment in sales growth in cement sector of Pakistan. Pakistan is a developing country facing the numerous political and economic problems especially terrorism and instability in peace which are considered main hurdles in its development. However, in the presence of these problems, there are some industries in Pakistan which comparatively remain stable and cement sector is one of them. Additionally, there are lot of projects started in the country in the form of construction of roads, highways (China Pakistan Economic Corridor), ports, dams, housing societies etc. These factors also increased the demand for the supply of construction related products. Currently, there is supply and demand gap in this industry which is an opportunity for the expansion of the sector. That is the reason why in this study cement sector is considered the only population. The current study is
therefore important because it provides empirical evidence regarding the relationship between investments in accounts receivable and sale growth of cement. In contrast to research into the role of accounts payable in overcoming financing constraints, the study provides valuable recommendations for the firm managers by increasing their investment in trade credit and to enhance their sale growth & profitability, and also useful to owners for decision making and debt holders as well as to academic researchers and policy makers.

The remainder of the paper is structured as follows: section 2 presents the previous literature on which the empirical analysis is based; section 3 describes the research methodology which consists of research hypotheses, variable selection, sample, and model specifications. Section 4 presents the findings, and the paper ends in section 5 with concluding remarks, limitations, and suggestions for further research.

2. Literature Review

Previous research on the trade credit conducted in different countries at different sectors has both positive and negative impact on sales growth & profitability of the organization. There are two approaches used in prior studies, theoretical approach and empirical approach.

2.1. Theoretical aspects

Biais & Gollier (1997) found that study of the trade credit is much better for those firms that have the problems of credit rationing and information asymmetry.

Petersen & Rajan (1997) conducted their research work on some important theories of trade credit and discussed in detail about financing advantage in trade credit, advantage in information acquisition, advantage of controlling the buyer, advantage in salvaging value from existing asset, price discrimination through trade credit and transaction costs theories. To achieve the study objectives, data was collected from small and large firms of USA. After testing the theories, they concluded that trade credit is more expensive financing option as compared to bank loan for small firms and suitable option for large & well-established firms (unconstraint firms).

Analyses of the data of Spanish SMEs from 2000 to 2007 shown the positive relationship between the profitability and trade credit (García-Teruel & Martínez-Solano, 2010).

Martínez-Sola et al. (2014) used the theoretical approaches. According to this approach trade credit is classified as financial, operational and commercial motives. Supplier may have better and cheaper access to capital markets as compared to buyer from financial perspective.

According to commercial approach, trade credit establishes long term relationships between supplier and buyer to increase the sales (Emery, 1984; Petersen & Rajan,
Trade credit considers as a tool to be used to retain customers in a competitive business environment (Cheng & Pike, 2003; Cunat, 2007). Some other studies also argue that improvement in sales may be taken by supply of trade credit (Berry & Jarvis, 2005; Hyndman & Serio, 2010). Blazenko & Vandezande (2003) suggest that sale can be supported by trade credit, especially when marginal costs increase. Moreover, since the supply of trade credit allows a buyer to delay payment, making payment after quality control, it improves the relationship between the parties and supports sales (Deloof & Jegers, 1999; Ng et al., 1999). The current study is based on the commercial approach, emphasizing the relationship between accounts receivable as a current asset and sales growth.

2.2. Empirical Studies
Petersen & Rajan (1997) used several univariate and multivariate methods to analyze a dataset comprising 3405 firms over the 1988 – 1989 period. They concluded that well-established suppliers might act as financial intermediaries by lending to financially constrained firms. The study also found some evidence supporting a positive and significant relationship between accounts receivable and firm sales growth.

Using a regression model, Niskanen & Niskanen (2006) studied a sample of 840 Finnish firms, mainly small ones, for a total of over 2700 annual observations over the 1994 – 1997 periods. The results indicated a significant and positive relationship between supply of trade credit and sales growth.

Using panel data methodology, García-Teruel & Martínez-Solano (2010) analyzed a dataset consisting of 47,197 SMEs in Europe over the 1996–2002 period. The results reflected strong homogeneity regarding the factors determining trade credit in European countries, indicating that growth is negatively related to accounts receivable for small firms.

Although Martínez-Sola et al. (2014) recently found a positive relationship between investment in accounts receivable and firm profitability, little empirical research has treated this issue, especially the impact of accounts receivable on firm growth.

3. Research Methodology
The study analyzes the relationship between trade credit and sale growth of cement sector in Pakistan. The data contain information related to firm’s age, sale growth, investment in account receivable and other information which is helpful for the investigation in this study. The panel data model (fixed effect) was used in analyzing the impact of trade credit proxy (investment in account receivable) on sale growth.

3.1. Sample
The objectives of this study were achieved by using the secondary data that have been taken from the audited annual reports of 17 firms of the cement sector, listed in Pakistan Stock Exchange (PSX). The analyses have been carried out by using the data of 8 years,
starting from 2007 to 2014. Those firms were excluded for which the data was not available or delisted from the stock exchange.

3.2. Variables and Research Hypotheses
In the current study, the selected variables were categorized into different groups to identify the impact of trade credit on sale growth. Dependent and independent variables are sales growth and supply of trade credit, respectively, whereas lagged sales growth, firm size and age of the firm are taken as control variables. The measurement of variables is based on their book value.

To examine the relationship between trade credit and sales growth, the dependent variable (sale growth) is measured as the annual percentage change of sales as mentioned by García-Teruel & Martínez-Solano (2010), Niskanen & Niskanen (2006), and Petersen & Rajan (1997), and independent variable, firm’s supply of trade credit, is measured as ratio of accounts receivable to total asset. Based on previous empirical studies like Niskanen (2006) and Petersen & Rajan, (1997), the first hypothesis is formulated as follows:

**H1:** There is a positive relationship between trade credit and sales growth.

The relationship between firm’s age and growth is considered complex, which explains the disagreement among previous studies. But number of previous empirical studies found that sales growth has positively affected by firm’s age (Das, 1995; Jovanovic, 1982), while some others studies have identified that firm’s age negatively impact on sale growth (Becchetti & Trovato, 2002; Geroski & Gugler, 2004). In the research of Autio (2005) firm’s age has been considered as an important explanatory variables of growth. In the current study, it is expected that there is positive relationship between these variables, so that forth hypothesis as follows;

**H2:** There is a positive relationship between firm’s age and its growth.

The measurement of firm’s age variable is natural logarithm number of years from firm inception to the year of data collection (Yazdanfar & Öhman, 2014).

Beck, Demirgüç-Kunt, & Maksimovic (2005) have suggested that firm size plays an important role in explaining firm growth and they also found that sales growth positively effect by trade credit. Firm size is measured as the natural logarithm of the firm’s book value of total assets. The theories of trade credit explain that larger firms have to take advantage of economies of scale and to have larger market shares, better capabilities to use technology, and better product diversification as compared to smaller firms (Jermias, 2008). But in the study of Becchetti & Trovato (2002) found negative relationship between trade credit and sales growth. But there is agreement with larger firm’s concepts of prior research, current study base the following hypothesis.
H₃: There is a positive relationship between firm size and sale growth.

Changes in current sales growth also relate to with the previous year sales growth. Rapidly growing firms are more likely to have a high growth capacity and better access to resources (Lockett, Wiklund, Davidsson, & Girma, 2011). Therefore, a firm’s current sales growth is also affected by its lagged sales growth. So that second hypothesis formulated as follows:

H₄: There is a positive relationship between lagged sales growth and sales growth.

4. Model specifications and measurement

The following model is used for our specified variables

\[
\text{Growth}_{it} = \beta_0 + \beta_1 A/R_{it} + \beta_2 \text{Size} + \beta_3 LGR_{it} + \beta_4 \text{Age}_{it} + \mu_{it}
\]

α = constant

Growth = natural logarithm of annual sales.

A/R=Accounts receivable; i.e. value of accounts receivable as a percentage of book value total assets.

LGR=Lagged growth measured as the annual percentage change of sales in the prior year.

Size = size of firm measured as the natural logarithm of the firm’s book value of total assets.

Age = age of firm measured as the natural logarithm of the number of years since firm’s inception, as of the year of data collection.

5. Data Analysis

5.1. Descriptive Analysis

This part shows the summary statistics of overall data given in Table I. It includes mean value, standard deviation, maximum and minimum values of all variables.

<table>
<thead>
<tr>
<th></th>
<th>Sale Growth</th>
<th>Trade Credit</th>
<th>Size</th>
<th>Lagged Growth</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>6.668925</td>
<td>0.015047</td>
<td>7.033904</td>
<td>5.668925</td>
<td>1.333022</td>
</tr>
<tr>
<td>Median</td>
<td>6.725466</td>
<td>0.006791</td>
<td>7.029611</td>
<td>5.725466</td>
<td>1.39794</td>
</tr>
<tr>
<td>Maximum</td>
<td>7.748579</td>
<td>0.175417</td>
<td>7.870609</td>
<td>6.748579</td>
<td>1.732394</td>
</tr>
<tr>
<td>Minimum</td>
<td>4.738337</td>
<td>8.32E-06</td>
<td>6.294224</td>
<td>3.738337</td>
<td>0</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.537639</td>
<td>0.025442</td>
<td>0.419907</td>
<td>0.537639</td>
<td>0.27375</td>
</tr>
<tr>
<td>Skewness</td>
<td>-1.01432</td>
<td>3.851466</td>
<td>0.021683</td>
<td>-1.01432</td>
<td>-1.781996</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>4.400065</td>
<td>19.76511</td>
<td>1.867346</td>
<td>4.400065</td>
<td>8.318279</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>38.73171</td>
<td>2170.075</td>
<td>8.19051</td>
<td>38.73171</td>
<td>261.2865</td>
</tr>
<tr>
<td>Probability</td>
<td>0</td>
<td>0</td>
<td>0.016651</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sum</td>
<td>1020.345</td>
<td>2.302236</td>
<td>1076.187</td>
<td>867.3455</td>
<td>203.9524</td>
</tr>
</tbody>
</table>
5.2. Regression Analysis
In this part, panel data (fixed effect) method is used to estimate the results. Eviews software was used to analyze the financial data.

5.3. Panel data
A data that includes a number of cross sections measured over a period of time. The main advantages of using panel data for analysis are

i. It increases the number of observations, so the results are more meaningful.
ii. It improves the degree of freedom.
iii. It enables researchers to measure unobserved cross sectional heterogeneity.

The error term in panel data consists of two parts, one is the conventional residual which arises because some of the variables that influence dependent variable are not included in the model while the other part is due to cross sectional heterogeneity.

\[ e_{it} = \mu_{it} + \lambda_i \]

Because of the uniqueness of the error term in panel data, its estimation techniques are different from those of cross sectional or panel data. There are three different techniques that are used to analyze micro panel data

1. Pooled OLS
   If it is assumed that all the cross sections are alike, that is, there is no cross sectional heterogeneity in the data, regression analysis are done by using pooled OLS. Normally this technique is not used in analyses because of its unrealistic assumption.

2. Fixed Effect Method
   If it is assumed that all the cross sections are different. That is, there is cross sectional heterogeneity and further it is also assumed that there is a correlation between independent variables in the model and the cross sectional heterogeneity, then fixed effect method, also called as least square dummy variable method is used.

   \[ Y_{it} = \alpha_i + \beta X_{it} + e_{it} \]

   The main advantage of this method is that the researcher has an option to measure cross sectional heterogeneity in form of separate values of intercept for each cross section.

3. Random Effect Method
   If it is assumed that there is cross sectional heterogeneity but there is a no correlation between independent variables in the model and the cross sectional heterogeneity, then random effect method is used.

   \[ Y_{it} = \alpha + \beta X_{it} + e_{it} \]
5.4. Hausman Test
Hausman Test, named after the statistician who presented it, is a statistical measure that is used to decide whether we should use fixed effect method or random effect method for the regression analysis. The null hypothesis of this test is:

\[ H_0 = \text{Random effect method should be used.} \]
\[ H_1 = \text{Fixed effect method should be used.} \]

If the p-value is significant, null hypothesis is rejected and fixed effect model is used. Applying the above mentioned methodology, Hausman test was applied to see whether the random effect method is appropriate or fixed effect. As per the result, fixed effect method seems appropriate for the analysis.

<table>
<thead>
<tr>
<th>Test Summary</th>
<th>Chi-Sq. Statistic</th>
<th>Chi-Sq. d.f.</th>
<th>Prob.</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cross-section random</td>
<td>57.619864</td>
<td>4</td>
<td>0.0000</td>
<td>Significant</td>
</tr>
</tbody>
</table>

6. Results

Fixed Effect

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-1.426848</td>
<td>1.123099</td>
<td>-1.270456</td>
<td>0.2065</td>
</tr>
<tr>
<td>Trade Credit</td>
<td>4.311607*</td>
<td>1.270880</td>
<td>3.392614</td>
<td>0.0010</td>
</tr>
<tr>
<td>Age</td>
<td>0.377235</td>
<td>0.240606</td>
<td>1.567854</td>
<td>0.1197</td>
</tr>
<tr>
<td>Size</td>
<td>0.778796*</td>
<td>0.184230</td>
<td>4.227290</td>
<td>0.0000</td>
</tr>
<tr>
<td>Lagged Growth</td>
<td>0.308129*</td>
<td>0.076588</td>
<td>4.023180</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Diagnostics

<table>
<thead>
<tr>
<th>R-Square</th>
<th>0.912759</th>
<th>Adjusted R-squared</th>
<th>0.897587</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
<td>60.15951</td>
<td>Prob. (F-statistic)</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

*significant at 5%

The outcomes of the panel data fixed effect model for the total sample are shown in Table II. All results were calculated at 5% significant level. Results from the table indicate that trade credit has significant positive effect on sales growth of the cement sector of Pakistan. It favors \( H_1 \) and consistent with previous studies like Petersen & Rajan (1997), Niskanen & Niskanen (2006), García-Teruel & Martínez-Solano (2010) and Martínez-Sola et al. (2014). Cement sector of Pakistan has very important and contributory role in constructive work going on not only in Pakistan but also in neighboring countries like Afghanistan. It adds value in national exchequer of the country. Turnover of the construction related products especially cement is high because of the rapidly building of dams, roads, housing societies, CPEC and in future
project of One Belt One Road (OBOR). Abovementioned result further signifies the phenomenon that if firms in the sector want to increase their revenues, supply of trade credit can add to it. With the efficient management of trade credit policy, firms in the sector can increase their sales remarkably. Age has also positive effect on sales growth but insignificantly which rejects H2 and inconsistent with some previous works (Das, 1995; Jovanovic, 1982) while consistent with some works (Becchetti & Trovato, 2002; Geroski & Gugler, 2004). Size has also a significant and affirmative impact on the sales growth of firm. It favors H3 and consistent with result of Beck, Demirguc-Kunt, & Maksimovic (2005) who asserted that firm size plays an important role in explaining firm growth.

Rapidly growing firms are more likely to have a high growth capacity and better access to resources (Lockett, Wiklund, Davidsson, & Girma, 2011). Therefore, a firm’s current sales growth is also affected by its low sales growth and as per the result in Table II indicate that lagged sales growth significantly affects the sales growth of the firm. It accepts H4.

The overall explanatory power of the model – measured by R² – is approximately 0.91. The rest of the change in the dependent variable may be explained by other variables, such as management, business environment, and macroeconomic factors.

7. Conclusions & Limitations

Conclusion is the final part of research studies. It summarizes and concludes the overall research study and highlights its limitation and suggestions for further studies in the areas.

The findings of this study can help the firm managers to perk up the firm’s sale growth by increasing their investment in account receivables for the developing countries i.e. Pakistan that have the problem the market imperfection. Moreover, this can be suitable when small firms face the constraints of loan from the financial institutions. A supplier may have a closer relationship with a buyer than does a bank, and thus be better able than a bank to monitor its business and make effective credit assessments. Furthermore, and most importantly, supplying trade credit seems to increase sales as more payment options attract more buyers. In line with this, Martínez-Sola et al. (2014) demonstrated that investments in accounts receivable are positively linked to firm’s profitability.

A firm’s credit policy is directly associated with its sales strategies, and a firm’s success seems to be related to its ability to collect and prevent default on investments in accounts receivable. Since the supply of trade credit is tied to both costs and benefits, managers should be concerned about how accounts receivable are managed. By adopting formal accounts receivable management routines in order to achieve or maintain an adequate accounts receivable level, cement sector can enhance their
growth. However, it must be remembered that accounts manager must also pay attention to inventory and accounts payable.

Given the scarcity of research into trade credit in Pakistan, this study supplements the existing literature on trade credit in several ways. Given the methodological limitations of previous studies, this study uses a more reliable method to identify the impact of credit supply on growth. However, this study, like any other study, is subject to limitations. First, the current study sample includes just cement sector. In view of the differences found between sectors, it would be of interest to investigate other industry sectors, extending the current study by examining a larger sample including different firms and sectors. Second, this study focuses exclusively on the influence of investments in accounts receivable on growth. Future studies could productively investigate the relationship between investments in accounts receivable and other performance variables. Third, while the current study’s emphasis is on the supply side of trade credit, it would be interesting to examine the demand side as well.

The study provides the valuable recommendations for the firm managers by increasing their investment in trade credit and to enhance their sale growth & profitability, especially for financially unconstrained firms, the firms that have capricious demand, and also for those firms with larger market share.

References


