Working Capital Management Practice and Its Impact on Profitability of Bangladeshi Companies

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Under the Supervision of

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DECLARATION

I hereby declare that the thesis entitled **"Working Capital Management Practice and Its Impact on Profitability of Bangladeshi Companies"** submitted to the University of Dhaka, Bangladesh for the degree of Master of Philosophy is based on my research work carried out under the supervision of Dr. Md. Rafiqul Islam, Professor, Department of Banking and Insurance, University of Dhaka. The material embodied in this thesis is original and has not been submitted in part or in full for any other degree, diploma, or title recognition of any university.

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CERTIFICATE

This is to certify that the thesis entitled **"Working Capital Management Practice and Its Impact on Profitability of Bangladeshi Companies"** is hereby submitted by **Oli Ahad Thakur**, student of M. Phil, Department of Banking and Insurance, University of Dhaka in partial fulfillment for the requirements of the degree of Master of Philosophy. It is also certified that the research work embodied in this thesis is original and carried out by him under my supervision. No part of the work has been submitted for any other degree.

He is permitted to submit the thesis.

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Oli Ahad Thakur
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DEDICATED TO MY PARENTS

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EXECUTIVE SUMMARY

Working capital is defined as investments in current assets such as accounts receivable, inventory. A significant portion of the total capital of a company is invested into current assets. So a question naturally arises in the mind of anyone who is related with business, whether s/he is a student of business or an academician in the arena of business or an investor who wants to invest in a company or even a member of the regulatory authority whose job is to ensure smooth operation of the business. The question is how important the efficient management of those current assets is. In other words, can management of working capital have a significant impact on performance of a company? To answer this question the current study set following objectives; to study the working capital management practice of Bangladeshi manufacturing companies, to measure impact of working capital management practice on profitability of Bangladeshi manufacturing companies and to identify the moderating impact of firm growth. To attain those objectives financial data from 53 nonfinancial companies which are listed on Dhaka Stock Exchange, was collected for a period of five years and was assembled to generate financial ratios such as Accounts Receivable Period, Inventory Conversion Period, Payable Payment Period, Cash Conversion Period. Those ratios are considered in the study to represent the efficiency of working capital management, in other word those are the independent variable of the study. To measure the impact of those variables on the performance of a company, Return on Assets and Tobin's q are taken as dependent variables of the study. Then statistical output such as descriptive statistics, correlation matrix and multiple regression result were generated. Through analyzing those statistical results the researcher found that companies in Jute Industry allow their customers on an average the highest time to pay their payables, they need on an average 86.64 days to collect their receivables. On average Bangladeshi manufacturing companies require 52 days to collect their receivables. Correlation between Return on Asset and accounts receivable period (AR) is negative (-.292) and highly significant. From regression it is found that accounts receivable period has negative effect on profitability. The study also found that companies in the Jute industry are slowest in terms of converting raw materials into finished goods (189 days). The overall average of Inventory Conversion Period is 112.92 days. Negative correlation (-.211) is found between Return on Asset and inventory conversion period and the correlation is highly significant (p= -.000). From regression result it is found that inventory conversion period has negative effect on profitability of Bangladeshi manufacturing companies. The overall mean value of accounts payable period is 42.68 days, which means Bangladeshi manufacturing companies are able to defer payments of their suppliers on an average of 43 days. Another important finding of the study is firm's growth has no significant moderating effect on the profitability of Bangladeshi manufacturing companies. So the study suggests that managers of Bangladeshi manufacturing companies should be concerned about managing the working capital of their company.

WORKING CAPITAL MANAGEMENT PRACTICE AND ITS IMPACT ON PROFITABILITY OF BANGLADESHI COMPANIES

CHAPTER 1
INTRODUCTION

1.1 Background of the Study

The theory in corporate finance is discussed in three main areas. The areas are capital budgeting, capital structure and working capital management (WCM). The capital budgeting and capital structure are the areas which are closely related to financing and long-term investment, and returns, while working capital management is related to managing current assets and current liabilities. Working capital and cash are imagined to be the blood current in the vessels of a business entity in order to save the survival of the business entity and management of this part is claimed to be the beating heart of a business entity which pumps up the blood into the vessels of the organization. Experiences have shown that one of the main reasons for financial disturbances and bankruptcies in most companies is the mismanagement of working capital (Setayesh, 2009).Working capital management is important because of its effects on the firm's profitability and risk, and consequently its value (Smith, 1980). Specifically, working capital investment involves a tradeoff between profitability and risk. Decisions that tend to increase profitability tend to increase risk, and, conversely, decisions that focus on risk reduction will tend to reduce potential profitability. In the present day context of rising capital cost and scarce funds, the importance of working capital needs special emphasis. It has been widely accepted that the profitability of a business concern likely depends upon the manner in which its working capital is managed. The inefficient management of working capital not only reduces profitability but ultimately may also lead a concern to financial crisis. On the other hand, proper management of working capital leads to a material savings and ensures financial returns at the optimum level even on the minimum level of capital employed. In practice, working capital management has become one of the most important issues in the

organizations where many financial executives are struggling to identify the basic working capital drivers and an appropriate level of working capital (Lamberson, 1995).

1.2 Research Gap and Problem Statement

The importance of working capital in the running of the day-to-day business activities of a firm has been emphasized in the literature. No firm can endure without proper liquidity management. While working capital is crucial to the operation of a firm, maintaining a sound working capital is more important. This is because excessive as well as inadequate working capital positions are dangerous from the firm's point of view. Excessive working capital means holding costs and idle funds which increases cost of the business. However, inadequate working capital not only impairs the firm's profitability but also results in production interruptions and inefficiencies and delivery disruptions. Historically, most of the financial managers' time and efforts are allocated towards bringing non-optimal levels of current assets and liabilities back to optimal levels (Lamberson, 1995). Working capital management has thus, become a basic and broad aspect of adjudicating the performance of a corporate entity. However, there are limited empirical investigations to explore the impact of working capital management on firm performance in Bangladesh. It is expedient to inquire into the nature of the relationship between working capital and profitability for developing countries like Bangladesh, taking cognizance of the characteristics of the firms in such economy, namely small size, low sales volume and limited access to finance among others.

In the present environment of cut-throat competition, almost all the business firms do not have any other option than cutting the cost of operations in order to be competitive as well as financially healthy. So, like other aspects of financial management, working capital management must have a significant role in reaching this target. However, a great deal of controversy exists over the issue whether the working capital of a firm, as determined by its financing and investment decisions, affects its profitability or not. On this issue academicians are sharply divided into two schools of thought (Mallik*et al.*, 2005). One school of thought argues that working capital is not a factor of improving profitability rather it may be negatively associated with earning capability. The other school of thought opines that investment in working capital plays a vital role in enhancing corporate

profitability and unless there is a minimum level of investment of working capital, output and sales cannot be maintained. They argue that inadequacy of working capital keeps fixed asset inoperative. Obviously a large number of considerations play a vital role in the development of arguments and counter arguments in this regard (Mallikand Sur, 1998).

Empirical studies also found the mixed result about the role of working capital management on firm performance. For example Raheman and Nasr (2007) studied the relationship between working capital management and corporate profitability for 94 firms listed on Karachi Stock Exchange using static measure of liquidity and ongoing operating measure of working capital management during 1999-2004. The findings of their study suggested that there exist a negative relation between working capital management measures and profitability. Similar results were also found by Sen. M (2009), Dong (2010), Zariyawati et al., (2009) and Vijaya (1977). On the other hand positive relation between working capital measures and profitability was found by Wang (2002), Mona (2012) and Akinlo (2012).

1.3 Research Questions

In the light of the above discussion, this study tried to seek answer to the following questions:

(i) What is the working capital management practice of Bangladeshi manufacturing companies?

(ii) What is the impact of working capital management practice on profitability of Bangladeshi manufacturing companies?

(iii) How does firm growth moderate the impact?

1.4 Research Objectives

Considering the importance of working capital management the researchers focused on evaluating the working capital management and profitability relationship. In this context the objective of this study is to provide empirical evidence about the effect of working capital and its components on profitability of a sample of 53 Bangladeshi manufacturing

firms listed on Dhaka Stock Exchange during the period of 2009-2013. Specific objectives of the study are:

(i) To study the working capital management practice of Bangladeshi manufacturing companies.

(ii) To measure impact of working capital management practice on profitability of Bangladeshi manufacturing companies.

(iii) To identify the moderating impact of firm growth.

1.5 Significance of the Study

Sound working capital management can explain the difference between a financially distressed and a profitable firm. Given the significant investment in working capital and the effect of working capital policy on firm risk in most firms, working management policy choices and practices could have important implications not only for accounting profitability but also for market performance. Successful management of resources will lead to corporate profitability. Given that management success might be measured by market value this study argues that efficient working capital management should bring more shareholders market value. The effect of working capital management policies in emerging market on both firms' accounting and market performance are studied here.

Since working capital management is best described by the cash conversion cycle this research tried to establish a link between accounting as well as market performance and management of the cash conversion cycle. This linkage includes all three very important aspects of working capital management. It is an indication of how long a firm can carry on if it was to stop its operation or it indicates the time gap between purchase of goods and collection of sales. The optimum level of inventories is expected to have a direct effect on profitability since it will release working capital resources which in turn will be invested in the business cycle, or will increase inventory levels in order to respond to higher product demand. Similarly both credit policy from suppliers and credit period granted to customers will have an impact on profitability. In order to understand the way working capital is managed, cash conversion cycle and its components effect on firms' market and accounting performance is statistically analyzed. Current research investigates the relationship between working capital management and firms' profitability for

manufacturing companies listed on the Dhaka Stock Exchange for the period 2009-2013. The findings of this study not only throw light on technical weakness in the managerial activities of the manufacturing companies in Bangladesh but may also help scholars and researchers to develop new ideas, techniques and methods in respect of the management of working capital.

1.6 Scope and Limitations of the Study

Working capital is required for all the business; whether it is a manufacturing business like steel mill or a service business like hotel, or even a combination of both, for example a restaurant. To understand the importance of efficient management of working capital, the current study attempted to identify the impact of working capital management on firm performance. To attain this objective only listed manufacturing companies of Bangladesh are covered. Among the manufacturing companies only 53 companies are covered which are listed on DSE. There are 100 other DSE listed manufacturing companies which are not taken into the study. In addition to this, 126 non-manufacturing companies are also listed on DSE which are not covered. Apart from listed companies a numerous other firms are operating in Bangladesh economy. So the study is not only limited to manufacturing companies but also limited to a very small sample of 53 DSE listed companies.

CHAPTER 2

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Concept of Working Capital Management

As one of the basic decisions in corporate finance, besides the capital structure decisions and capital budgeting decisions, working capital management is a very important component of corporate finance since efficient working capital management will lead a firm to react quickly and appropriately to unanticipated changes in market variables, such as interest rates, and raw material prices, and gain competitive advantages over its rivals (Appahami, 2008). Van Horne (1995) states that managing working capital involves making decisions on the investment of available cash, maintaining a certain level of inventories, managing accounts receivable and accounts payable. According to Odi and Solomon, (2010) decisions relating to working capital and short term financing are referred to as working capital management. These involve managing the relationship between a firm's short term assets and its short term liabilities. The goal of working capital is to ensure that the firm is able to continue its operations and that it has sufficient cash flow to satisfy both maturing short term debt and forthcoming operational expenses. Mahmood and Qayyum, (2010) pointed out that to increase profitability of a company and to ensure sufficient liquidity to meet short-term obligations as they fall due, are two main objectives of working capital management. Profitability is related to the goal of shareholders' wealth maximization, and investment in current assets is made only if an acceptable return is obtained. While liquidity is needed for a company to continue business, a company may choose to hold more cash than needed for operational or transactional needs i.e. for precautionary or speculative reasons. Working capital has acquired a great significance and sound position in recent years with an objective of profitability and liquidity (Ranjith, 2008). Higher amount of working capital will increase the liquidity but at the same time will create impact on profitability. Lower amount of working capital will decrease the liquidity but day to day functioning of business will also be affected. Smith and Begemann (1997) noted that the salient goal of working capital management is, striking a balance between profitability and liquidity, the firm's need to look for ways of financing its operations. Anand and Gupta (2001) affirm that, higher liquidity in a firm gives the

comfort of meeting short-term liabilities but at the cost of profitability and on the other hand, too little of it may increase the profitability but at a greater risk of not meeting the short-term obligations.

2.2 Impact of Level of Working Capital on Profitability

The nature of the relationship between WCM and profitability depends on the strategy that the firm decides to pursue (Weinraub and Visscher, 1998; Garcia-Teruel and Martinez-solano, 2007; Nazir and Afza, 2009). An increase in inventory can prevent production disruption (Garcia-Teruel and Martinez-solano, 2007), reduce supply cost and price fluctuations (Blinder and Maccini, 1991). Also an increase in accounts receivables can increase sales because it allows customer the time to pay (Long et al., 1993; Deloof and Jegers, 1996), reduces the information asymmetry between buyer and seller, and can be inexpensive source of credit for customers (Peterson and Rajan, 1997; Deloof, 2003). Trade credit can help customers to differentiate between products (Shiply and Davis, 1991; Deloof and Jegers, 1996), can be used as effective price cut (Brennan et al., 1988; Peterson and Rajan, 1997), and to strengthen long-term supplier/customer relationship (Wilner, 2000). However, increasing investment in working capital may result in opportunity cost of cash tied-up in inventory, accounts receivables and increased inventory storage and issuance cost which could reduce the profitability of the firm (Deloof, 2003)

For a typical manufacturing company, current assets account for over half of its total assets. So the investment in current assets should have a profound effect on profitability of a manufacturing firm. Theoretically levels of current asset have negative effect on profitability of a company as higher investment in current asset means higher cost of capital. But this simple relation is not established through past empirical studies. In some studies a negative relation between profitability and working capital variables is found whereas in some other studies positive relation is found and in some other studies mixed or insignificant impact of working capital on profitability is found. So for the purpose of this thesis past studies are categorized in terms of impact i.e. negative, positive, insignificant and mixed.

2.2.1 Negative Impact:

Most empirical studies relating to working capital management and profitability support the fact that aggressive working capital policies enhance profitability. In particular, Jose et al. (1996) provide strong evidence for US companies on the benefits of aggressive working capital policies. One of the pioneer studies to investigate the relationship between working capital and profitability is Soenen (1993). He examined the relationship between the net trade cycle as a measure of working capital and return on investment in US firms. The results of the Chi-square test showed a negative relationship between the length of net trade cycle and the return on assets. Shin and Soenen (1998) analyzed the relation between the net trade credit and profitability for a sample of firms listed on the US stock exchange during the period 1974-1994. Their results also show strong evidence that reducing the net trade credit increases firms' profitability. However, this relationship is not found to be very strong when the analysis is at the level of a specific industry (Soenen, 1993). Deloof (2003) analyzed a sample of large Belgian firms during the period 1992-1996. His results confirm that Belgian firms can improve their profitability by reducing the number of days accounts receivable are outstanding and reducing inventories. Moreover, he finds that less profitable firms wait longer to pay their bills.

Raheman and Nasr (2007) studied the relationship between working capital management and corporate profitability for 94 firms listed on Karachi Stock Exchange using static measure of liquidity and ongoing operating measure of working capital management during 1999-2004. The findings of their study suggested that there exist a negative relation between working capital management measures and profitability

Dong (2010) reported that the firm's profitability and liquidity are affected by working capital management. Pooled data are selected for carrying out the research for the era of 2006-2008 for assessing the companies listed in stock market of Vietnam. He focused on the variables that include profitability, conversion cycle and its related elements and the relationship that exists between them. From his research it was found that the relationships among these variables are strongly negative.

Zariyawati et al., (2009) studied the relationship between profitability and the length of the cash conversion cycle using six different economic sectors which are listed in Bursa, Malaysia. Their analysis provides a strong negative significant relationship between cash conversion cycle and firm profitability.

Vural, Sokmen and Cetenak, (2012) developed five models to check the relationship between working capital management and firm's performance. Data was taken from 75 companies listed on Istanbul Stock Exchange during the period 2002-2009. Tobin's q and operating profit were taken as proxies of profitability and firm value. It was concluded from the result that cash conversion cycle and average collection period were having negative relation with profitability, which means that by reducing both of them profitability will increase.

Vijaya (1977) in his study examined the relationship between working capital and return on investment in six cooperatives and seven private sector companies in the sugar industries of Tamil Nadu. This study revealed that there was a negative correlation between return on investment and working capital.

Garcı´a-Teruel and Martı´nez-Solano (2007) studied 8872 Spanish small to medium-sized enterprise (SMEs) during the period 1996-2002 to see the effect of working capital management on profitability. Their study shows that paying suppliers and collecting payments from customer earlier and keeping products in the stock less time, are all associated with an increase in the firm's profitability, shortening the cash conversion cycle is associated with higher profitability.

Samiloglu and Dermigunes (2008) in Turkey evaluated the effect of working capital on firm profitability. The result of the study provide that inventory period, accounts receivable period and leverage negatively affect firm's profitability while growth in sales positively affects firm's profitability.

Ukaegbu (2013) studied 102 large firms from Egypt, Nigeria and 42 from South Africa for the period of 2005 to 2009. He found inverse relationship between the number of days a firm takes to collect cash from their customers and profitability across the four countries. He also found that the relationship between profitability and accounts payable is positive

for firms in Egypt and inverse for companies in other countries. According to this study, inventory turnover ratio which measures the velocity of conversion of stock into sales is positively correlated with profitability in Kenya, Nigeria and South Africa. Cash conversion cycle measuring working capital management has an inverse relationship with profitability across the four countries. He concluded that managers can create value for their shareholders by reducing cash conversion cycle.

Tauringana and Afrifa (2013) studied 133 Alternative Investment Market (AIM) listed SMEs for the period of 2005 to 2009. They found that it takes on average 87.40 days for firms to turn over their inventory, while the median in days is nil, which suggest that most of the SMEs have no inventory. It takes on average 81.23 days for the SMEs to receive payments (AR). The SMEs take on average 59.7 days to pay their trade creditor, with a median of 27.2 days. They also found significant and negative correlation between profitability and both AR and AP. It is evident that AR has a more significant relationship to profitability measured by ROA. According to the regression result INV is negatively associated with ROA but the relationship is not significant. AR is negatively associated with profitability and significant at 5% level. CA/TA, FA/TA Lev and TA_LOG are also significant in explaining the variability in profitability.

Sharma and Kumar (2011) attempted to see the effect of working capital management on profitability of Indian companies. They selected 263 non-financial BSE 500 firms listed at the Bombay Stock Exchange (BSE) from 2000 to 2008. They found that firm's profitability can be increased by reducing the number of days of inventory held in the firm. Their study suggests that managers can improve profitability by increasing the credit period granted to their customers. However a positive relationship is found between profitability and number of days of accounts receivable.

Alavinasab and Davoudi (2013) studied the relationship between working capital management and profitability of147 companies listed in Tehran stock exchange for the period of 2005-2009. They found significant negative relation between the cash conversion cycle and return on asset, significant positive relationship between current assets to total asset ratio and return on assets, significant negative relationship between current liabilities

to total assets ratio and return on assets and significant negative relationship between total liabilities to total asset ratio and return on assets.

Quayyum (2011) made an attempt to investigate the effects of working capital management efficiency on the profitability of Bangladeshi corporations over a period of 2005 to 2009. Her study suggests that return on asset, net profit margin and interest coverage ratio all are negatively correlated with the cash conversion cycle, which indicate that more profitable firms either delay their payment towards their suppliers-creditors or accelerate their receivables.

Ghosh and Maji (2004) made an empirical study on the relationship between utilization of current assets and operating profitability in the Indian cement and tea industry. The study concluded that the degree of utilization of current assets was positively associated with the operating profitability of all the companies under study.

Ali (2011) conducted a research on textile sector of Pakistan. The results showed a significant and negative relationship between return on assets, average days receivables and average day's payable while positive and significant relation between average age of inventory and return on assets. Also a positive relationship was found between return on asset and cash conversion cycle which shows that stretching cash conversion cycle would be more profitable for textile sector.

Mahammadi (2009) examined the impact of working capital management on profitability for listed companies on Tehran Stock Exchange. Research findings show the existence of negative relationship between number of days accounts payable, cash conversion cycle and profitability.

YaghoobNejad, et al., (2010) examined the relationship between working capital management and profitability on a selected sample of 86 active companies on Tehran Stock Exchange for the period of 2002-2007. The results show that there is a negative relationship between variables of working capital management and profitability.

2.2.2 Positive Impact

Wang (2002) points out that if the inventory levels are reduced too much, the firm risks losing increases in sales. Also, a significant reduction of the trade credit granted may provoke a reduction in sales from customers requiring credit. Similarly, increasing supplier financing may result in losing discount for early payments. In fact, the opportunity cost may exceed 20 percent, depending on the discount percentage and the discount period granted (Wilner, 2000; Ng et al., 1999)

Mona (2012) investigated the impact of aggressive and conservative policies on 57 Jordanian firms' profitability and value between 2001 and 2009. Measuring conservative policy as the level of current assets relative to total assets, she found the ratio to be 0.49 and the regression method of estimation indicates that this affects a firm's profitability and value positively. On the other hand, those firms that follow an aggressive investment policy using long-term investment have a negative effect on firm profitability and value. Although the sample size was small, similar results were found by Afza and Nazir (2007).

Mallik et al., (2005) carried out a study on the relationship between working capital and profitability with reference to selected companies in the pharmaceutical industry and noticed that the joint influence of the liquidity, inventory management and credit management on the profitability were statistically very significant in nine out of seventeen pharmaceutical companies selected for the study.

Chakraborty (1976) evaluated the association between working capital turnover and profitability in Indian cement, sugar and fertilizer industries and found a positive relationship between them.

Akinlo (2012) examined the relation between working capital management and profitability for a sample of 66 Nigerian non-financial firms for the period 1997–2007. The study found that working capital requirement is positively correlated with profitability and less profitable firms take a longer time to settle payments to creditors.

2.2.3 Mixed or Indefinite Impact

Amit et al., (2005) examined the relationship between working capital and profitability in the context of Indian pharmaceutical industry and concluded that no definite relationship could be established between liquidity and profitability.

Abuzayed (2012) did a research on companies listed on Amman Stock Exchange for the period of 2000 to 2008 and found significant correlation between the net operating profit and the cash conversion cycle as well as its three components. However, surprisingly the correlation between the GOP, CCC, DAR and DI are positive, showing that firms with higher profits are less concerned with efficient management of working capital. The negative and significant correlation between DI and TQ (-.115) indicates that investors in the financial market still focus more on the management skills in managing firms inventory and considers that the longer the cash conversion cycle the less the efficiency in managing firm's liquidity. The researcher concluded that more profitable firms are less motivated to manage their working capital; one explanation for such positive relation may be the failure of the market to penalize these firms with inefficient management of working capital.

Filbeck and Krueger (2005) highlighted the significance of efficient working capital management by analyzing the working capital management policies of 32 non-financial industries in the United States (US). According to their findings, significant differences in working capital practices exist among industries over time. Moreover, these working capital practices change significantly within industries over time. Similar studies with similar findings were conducted by Long et al. (1993) and Maxwell et al. (1998).

2.2.4 Insignificant Impact

Ayub (2015) conducted a research on of 138 Pakistani textile firms listed on Karachi Stock exchange for a Period of 8 years from 1999-2007 to see the impact of working capital management on profitability. His study suggests that Working capital management is not strongly associated with the profitability of the firms because there are other factors that may significantly influence their association and thus working capital management of

firms is not able to get any incentive in terms of profitability of firms. He concluded that there is little statistical reason to believe that there is a strong relation between working capital management and profitability of textile firms in Pakistan.

Malik and Bukhari (2014) studied the impact of working capital management on corporate performance of companies in Cement, Chemical and Engineering Sectors of Pakistan and found that average collection period is not significant but having a positive relationship with profitability. Average age of inventory is not significant and is having a negative relationship with ROE.A significant but negative relationship of average payment period with profitability is found. Pooled OLS estimation suggests that operating cycle has positive insignificant relationship with ROE. Cash conversion cycle is having a significant and positive relationship with profitability

Vishnani and Shah (2007) studied the role of working capital management on profitability in Indian Consumer Electronics Industry and found negative correlation between current ratio and ROCE; however, none of the nine companies depicted the significant negative correlation. They concluded that, on the whole there is no established relationship between liquidity and profitability.

Past studies in the area of working capital management have employed similar dependent and independent variables, similar tools and techniques such as regression and correlation. However no conclusion could be drawn regarding the impact of working capital management on profitability.

2.3 Hypothesis Development

A great deal of controversy exists over the issue whether the working capital of a firm, as determined by its financing and investment decisions, affects its profitability or not. On this issue academicians are sharply divided into two schools of thought (Malliket al., 2005). One school of thought argues that working capital is not a factor of improving profitability rather it may be negatively associated with earning capability. The other school of thought opines that investment in working capital plays a vital role in enhancing

corporate profitability and unless there is a minimum level of investment of working capital, output and sales cannot be maintained. They argue that inadequacy of working capital keeps fixed asset inoperative. Obviously a large number of considerations play a vital role in the development of arguments and counter arguments in this regard (Mallik and Sur, 1998).

Raheman and Nasr (2007) investigated the impact of average collection period, inventory turnover in days, average payment period and cash conversion cycle on the net operating profitability of firms. They established significant relationship between the variables. Their findings are consistent with Padachi (2006), who tested key variables such as inventory days, accounts receivables days, cash cycle and profitability to evaluate working capital management in Mauritian small firms. Other similar studies include Eljelly (2004), Filbeck and Kgugner (2005), Howorth and Westhead (2003), Lazaridis and Tryfonidis (2006) and Teruel and Solano (2007)

Empirical evidence of the relationship between CCC and its components (INV, AR, and AP) and profitability is, however, mixed. For example, the relationship between WCM measured by the CCC and profitability was found to be negative and significant by Hayajneh and Yassine(2011) and Karaduman et al. (2011), consistent with the aggressive strategy of WCM. Similarly, the results in respect of the relationship between components of WCM and profitability are also contradictory. For example, in respect of INV and AR, Raheman and Nasr (2007) found a positive relationship between profitability and the two components of WCM which is considered with the conservative strategy of WCM. However Deloof (2003) and Alipour (2011) both found a significant relationship between both INV and AR and profitability in line with the aggressive strategy of WCM. Finally, the existing research is also conflicting in respect of the relationship between AP and profitability. For example, significant positive relationship between AP and profitability consistent with the aggressive strategy are reported by Raheman and Nasr (2007) and Mathuva (2010). In contrast, Ramachandaran and Janakiraman (2009), Deloof (2003) and Karaduman et al. (2010) all found a negative relationship consistent with the conservative strategy of WCM.

2.3.1 Account Receivable Period and Profitability

An increase in accounts receivable can increase sales because it allows customers time to pay (Long et al., 1993; Deloof and Jegers, 1996), reduces the information asymmetry between buyer and seller, and can be an inexpensive source of credit for customers (Peterson and Rajan, 1997; Deloof, 2003). Trade credit can help customers to differentiate between products (Shipley and Davis, 1991; Deloof and Jegers, 1996), can be used as an effective price cut (Brennan et al., 1988; Peterson and Rajan, 1997), and strengthens long-term supplier/customer relationships (Wilner, 2000). This increase in accounts receivable also means higher investment in working capital and thus higher opportunity cost of capital. So the impact of account receivable period on profitability can be either negative or positive.

Thus the first hypothesis is:

H_o : Accounts receivable period has negative effect on firm's profitability ($\beta_1 \leq 0$)

H_1 : Accounts receivable period has positive effect on firm's profitability ($\beta_1 > 0$).

2.3.2 Inventory Conversion Period and Profitability

Like accounts receivable period, increase in inventory holding period may reduce the chance of stock out but again it is at the cost of increased investment in working capital and thus opportunity cost of cash tied-up in inventory, and increased inventory storage and insurance costs which could reduce the profitability of the firm (Deloof, 2003). Wang (2002) points out that if the inventory levels are reduced too much, the firm risks losing increases in sales. Also pointed out by Blinder and Maccini, (1991) that maintaining high inventory levels reduces the cost of possible interruptions in the production process and of loss of business due to the scarcity of products, reduces supply costs, and protects against price fluctuations, among other advantages. Again the impact of inventory holding period can be in any direction. So the second hypothesis is:

H_o : Inventory holding period has negative effect on firm's profitability ($\beta_2 \leq 0$)

H_1 : Inventory holding period has positive effect on firm's profitability ($\beta_2 > 0$).

2.3.3 Account Payable Period and Profitability

Delaying payments to creditors can be an inexpensive and flexible source of financing for a firm (Deloof, 2003). At the same time an attempt to demand more credit from suppliers may reduce profitability as the firm may lose out on the discounts (Svensson, 1997). In fact, the opportunity cost may exceed 20 percent, depending on the discount percentage and the discount period granted (Wilner, 2000; Ng et al., 1999). The current study attempts to see whether account payable period has negative or positive impact on profitability setting hypothesis number 3:

H_o : Accounts payable period has positive effect on firm's profitability ($\beta_3 \geq 0$)

H_1 : Accounts payable period has negative effect on firm's profitability ($\beta_3 < 0$).

2.3.4 Cash Conversion Period and Profitability

Shin and Soenen (1998) analyzed the relation between the CCC and profitability for a sample of firms listed in the US stock exchange during the period of 1974-1994. Their result showed that shortening the CCC to a reasonable extent increased firm's profitability.

Empirical evidence of the relationship between CCC and its components (INV, AR and AP) and profitability is mixed. For example, the relationship between WCM measured by the CCC and profitability was found to be negative and significant by Raheman et al. (2010), Hayajneh and Yassine (2011) and Karaduman et al. (2011). However, a positive and significant relationship was reported by Raheman and Nasr (2007), Mathuva (2010) and Stephen and Elvis (2011).

Shin and Soenen (1998) investigated the relation between a measure of the cash conversion cycle and corporate profitability. For a larger sample of listed American firms for the period 1975-1994, they found a strong negative relation. This result indicates that managers can create value for their shareholders by reducing the cash conversion cycle to a reasonable minimum.

Eljelly (2004) examined the relation between profitability and liquidity measured by the current ratio and cash gap (CCC) on a sample of joint stock companies in Saudi Arabia. The paper adopted both correlation and regression analysis. The study showed that the CCC was of more importance as a measure of liquidity than the current ratio that affects profitability.

Padachi (2006) found a positive relationship between CCC and profitability for Mauritian small manufacturing firms.

Lyroudi and Lazaridis (2000) used Greek food industry to examine the cash conversion cycle as a liquidity indicator of the firms and tried to determine its relationship with the current and the quick ratios, with its component variables. They investigated the implications of the CCC in terms of profitability, indebtness and firm size. The results of the study indicate that there is a significant positive relationship between the cash conversion cycle and the traditional liquidity measures of current and quick ratios.

Zariyawati et al., (2009) used panel data of 1628 firm-years for the period between 1996-2006 that consisted of six different economic sectors, in order to examine the relationship between working capital management and firm profitability of the firms listed in Malaysia. Result of this study show that the CCC is significantly negatively associated with the firm profitability.

Luo et al., (2009) find that efficiency of a firm's working capital management has a lasting impact on the firm's performance. Improvement in working capital efficiency leads to increase in future earnings, as the market responds positively to the improvement of working capital efficiency. Firm value increases when cash conversion cycle decreases.

Izadima and Taki (2010) examined the effects of working capital management on capability of profitability for listed companies on Tehran Stock Exchange for the period of 2001-2008. The results indicate that there is a negative significant relationship between cash conversion cycle and return on assets and also a lot of investment in inventories and accounts receivable leads to declining profitability.

As the empirical results showed the mixed impact of CCC on profitability, the current study intends to test the following hypothesis as hypothesis # 4:

H_o : Cash conversion cycle has negative effect on firm's profitability ($\beta_4 \leq 0$)

H_1 : Cash conversion cycle has positive effect on firm's profitability ($\beta_4 > 0$).

2.3.5 Firm's Size and Profitability

Theoretically, the nature of the relationship between firm size and profitability is indeterminate. There is the argument that large firms tend to enjoy economies of scale in production which can translate into higher profit. Also, from the agency theoretic point of view, larger firms' managers have lesser incentives to hold large liquidity as they have less information asymmetry and better access to the money market. This might possibly impact positively on their profit level. The reverse will be the case with small firms that are faced with more borrowing constraints and bigger costs of external financing. Nevertheless, there is the argument that many large firms could experience lower profit rates because of diminishing returns to the fixed factors of management (Robinson, 1933).

According to one group of economists led by Steindl (1944) and Baumol (1967), the market power conferred by large firm size and the increased money capital which put the firm in a higher echelon of imperfectly competing capital groups will tend to increase the firm's profit rates. In their views, large firms are capable of encashing the investment opportunities which bring larger profit rates but the smaller firms cannot take them because of financial difficulties. In addition, it is argued that firm size measured through its market share provides better product differentiation opportunities to it, allows the firm to operate in the oligopolistic bargaining power and other activities and provides scope to gain the advantages from pecuniary benefits, advertisement and economies of scale or marketing if not in the decreasing zone of the cost curve. Hence, from all these, larger firms are expected to be more profitable. The evidence that accumulated over the years was mixed. Hall and Weiss (1967) reported that size did tend to be associated with higher profits

among the Fortune 500 companies for the period 1956–1962. Stekler (1963) and Osborn (1970), however, reached the opposite conclusion. So the fifth hypothesis is:

H_o : Firm size has no effect on firm's profitability ($\beta_5 = 0$)

H_1 : Firm size has effect on firm's profitability ($\beta_5 \neq 0$).

2.3.6 Moderating Impact of Firm's Growth

The current study also tries to identify whether firm's growth has any significant moderating impact on the profitability of Bangladeshi manufacturing companies. Finally the sixth hypothesis is:

H_o : There is no moderating impact of firm growth on the relationship between working capital management and firm performance. ($\beta_6 = 0$)

H_1 : There is a moderating impact of firm growth on the relationship between working capital management and firm performance. ($\beta_6 \neq 0$)

CHAPTER 3

METHODOLOGY

3.1 Nature of the Study

The study is of causal nature because the main purpose of the study is to examine the relationship between working capital management practice and financial performance of a company

3.2 Population and Sample Size

The data is collected from manufacturing firms listed in the Dhaka Stock Exchange. Currently there are 279 listed companies in Dhaka Stock Exchange. Those companies are categorized into 18 different industries which are, Bank (30), Cement(7), Ceramics Sector(5), Engineering(29), Financial Institutions(23), Food & Allied(18), Fuel & Power(17), IT Sector(6), Jute (3), Insurance(46) , Paper & Printing (2), Pharmaceuticals & Chemicals (27), Services & Real Estate (4), Tannery Industries(5), Telecommunication(2), Textile(40), Travel & Leisure(4), and Miscellaneous (11). As inventory is a major component of working capital and certain businesses do not have inventory (or even if they have the amount is not significant), working capital need and management policy may vary from industry to industry. To maintain homogeneity in data, the current research covered only the manufacturing companies. Out of these 18 industries, 10 include manufacturing companies. However the Food and Allied industry apparently has an anomaly; all the companies in this industry are not manufacturing companies. As a result those companies are also omitted. In addition some of the companies are omitted due the unavailability of data. Finally, 30 percent companies from each sector are selected. As a result the sample size of the study is 53.

Table 1: Manufacturing companies listed in DSE

Sl. No	*Sector/industry*	*Quantity*	*Sample*
1	Cement	7	3
2	Ceramics Sector	5	3
3	Engineering	29	9
4	Food & Allied	18	7
5	Fuel & Power	17	5
6	Jute	3	1
7	Paper & Printing	2	1
8	Pharmaceuticals & Chemicals	27	9
9	Tannery Industries	5	2
10	Textile	40	13
	Total	**153**	**53**

3.3 Sampling Technique

A sample design is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher adopts in selecting items for the sample. The population is divided into different sectors. To ensure the representation of each sector/industry, in this study quota sampling is used. In addition, criteria such as reputation of the company, condition of the company, availability of data etc are also taken into consideration.

3.4 Data Collection

Fist of annual reports of all the sample companies were collected from DSE library for last 5 years (2009-2013). Financial data such as sales, cost of sales, current assts etc were extracted from those reports. Then those financial data was copied in a Microsoft Excel file to calculate the values of different dependent and independent variables. Thus the current study is based on only secondary data.

3.5 Variables of the Study

In order to analyze the effects of working capital management on the firm's profitability, return on assets (ROA) and Tobin's Q are used as the dependent

variables. With regards to the independent variables, working capital management is measured by using the number of days of accounts receivable, number of days of inventory and number of days of accounts payable. Considering these three periods jointly, cash conversion cycle (CCC) is estimated. Firm size, current ratio, industry and financial leverage are used as control variables. Sales grow this used as a moderating variable.

3.6 Data Analysis Tools

Descriptive statistical tools such as mean, standard deviation are calculated to identify the current practices of working capital management and deviations among firms. Pearson's correlation is calculated. Simple and multiple regression analyses were done to see the effects of working capital management on corporate profitability. Variance inflation factor (VIF) and Durbin Watson (DW) statistics were also calculated to see whether there is multicollinearity or autocorrelation problem. R^2 and Adjusted R^2 values of each model were calculated to see the explanatory power of the models. Coefficients of all the independent variables were calculated to see the magnitude of the effect of independent variables on the dependent variable. T-test results were examined to indentify whether the impact of the independent variables are significant or not. Finally F-values of each model were calculated to see the fitness of the models. Following regression models were constructed:

Model 1: Impact of working capital management on ROA. To identify the impact of working capital management on the accounting return of a company, regression models were constructed with individual components as independent variable and also combining all the components together models were constructed. Similar models were constructed and tested by Nazir and Afza (2009), Zariyawati et al. (2008), Samiloglu and Demirgunes (2008) and Garcia-Teruel and Martinez-Solano (2007).

Model 1(a)

$$ROA = \beta_0 + \beta_1 LEV + \beta_2 FSIZ + \beta_3 AR + e$$

Model 1(b)

$ROA = \beta_0 + \beta_1 LEV + \beta_2 FSIZ + \beta_3 INV + e$

Model 1(c)

$ROA = \beta_0 + \beta_1 LEV + \beta_2 FSIZ + \beta_3 AP + e$

Model 1(d)

$ROA = \beta_0 + \beta_1 LEV + \beta_2 FSIZ + \beta_3 CCC + e$

Model 1(e)

$ROA = \beta_0 + \beta_1 AR + \beta_2 INV + \beta_3 AP + \beta_4 CCC + \beta_5 FG + \beta_6 CR + \beta_7 LEV + \beta_8 FSIZ + e$

Model 1(f)

$ROA = \beta_0 + \beta_1 AR + \beta_2 AP + \beta_3 CCC + \beta_4 LEV + \beta_5 FSIZ + e$

Model 1(g)

$ROA = \beta_0 + \beta_1 AR + \beta_2 INV + \beta_3 AP + \beta_4 LEV + \beta_5 FSIZ + e$

Model 1(h)

$ROA = \beta_0 + \beta_1 AR + \beta_2 INV + \beta_3 LEV + \beta_4 FSIZ + e$

Model 2: Impact of working capital management on Tobin's q. Following the models developed by Abuzayed (2012), Nazir and Afza (2009) andVural, Sokmen and Cetenak (2012) in addition to measuring the impact of working capital management of accounting rate of return such as ROA, impact on market based measure such as Tobin's q is also identified.

Model 2:

$TQ = \beta_0 + \beta_1 AR + \beta_2 INV + \beta_3 AP + \beta_4 CCC + \beta_5 FG + \beta_6 CR + \beta_7 LEV + \beta_8 FSIZ + e$

Model 3: Moderating impact of firm's growth.

Model 3.a.

$ROA = \beta_0 + \beta_1 AR*FG + \beta_2 INV*FG + \beta_3 AP*FG + \beta_4 CCC*FG + \beta_5 CR + \beta_6 LEV + \beta_7 FSIZ + e$

Model 3.b.

$TQ = \beta_0 + \beta_1 AR*FG + \beta_2 INV*FG + \beta_3 AP*FG + \beta_4 CCC*FG + \beta_5 CR + \beta_6 LEV + \beta_7 FSIZ + e$

Table 2: Definition of the variables

Variable	*Symbol*	*Definition*
Dependent Variables		
Return on Asset	ROA	Earnings before interest to total assets
Tobin's Q	TQ	(Equity market value+ liability book value)/(Equity book value + liability book value)
Independent Variables		
Number of Days of Accounts Receivable	AR	(Accounts receivable/sales)×365
Number of Days of Inventory	INV	(Inventory/purchase)×365
Number of Days of Accounts Payable	AP	(Accounts Payable/purchase)×365
Cash Conversion Cycle	CCC	AR+INV-AP
Moderating Variable		
Firm Growth	FG	(Year 1's sales-Year 0' sales)/ Year 0's sales
Control Variables		
Firm Size	FSIZ	Log of total assets
Current Ratio	CR	Current assets/Current liabilities
Financial Leverage	LEV	Total long term debt/total shareholder equity

CHAPTER-4
RESULT AND ANALYSIS

4.1 Working Capital Management Practice

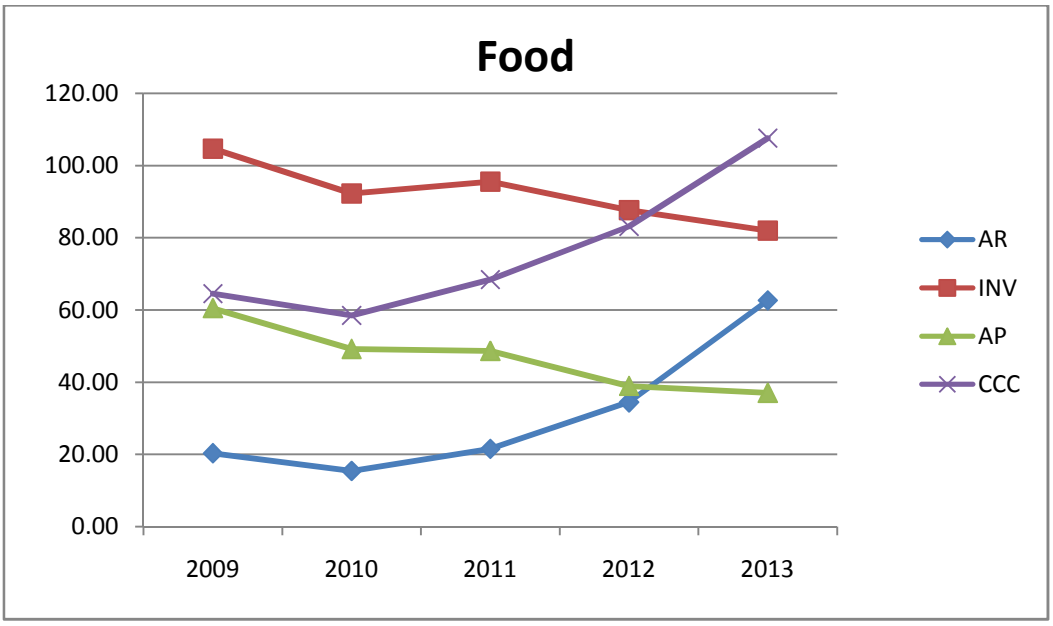
The money that the investor uses to start or run a business is called the capital. This capital is invested into assets, which include everything from the most obvious items such as property, plant and equipment, inventory, and cash, to less obvious items such as customer's financing. The investor invests money with some expected return in his/her mind. Aiming to meet the expected returns, after selecting an optimal investment the business must use the investment to produce goods and/or services that will be sold to customers. In generating these sales, a firm will incur several costs, for example, materials and production costs, storage and distribution costs, employee-related costs, and taxes. What is left after collecting revenues and paying the related costs is the firm's profit, which is the basis for estimating the investors' return on investment.

4.1.1 Industry -Wise Practice

Current assets and liabilities have a series of distinct characteristics according to the sector of activity in which the firm operates. Table A.1.a to Table A.1.g in the appendix report account receivable period, inventory conversion period account payable period, and cash conversion period by sector of activity.

4.1.1.1 Food Industry

Figure 1: Year-Wise Working Capital Components of Food Industry

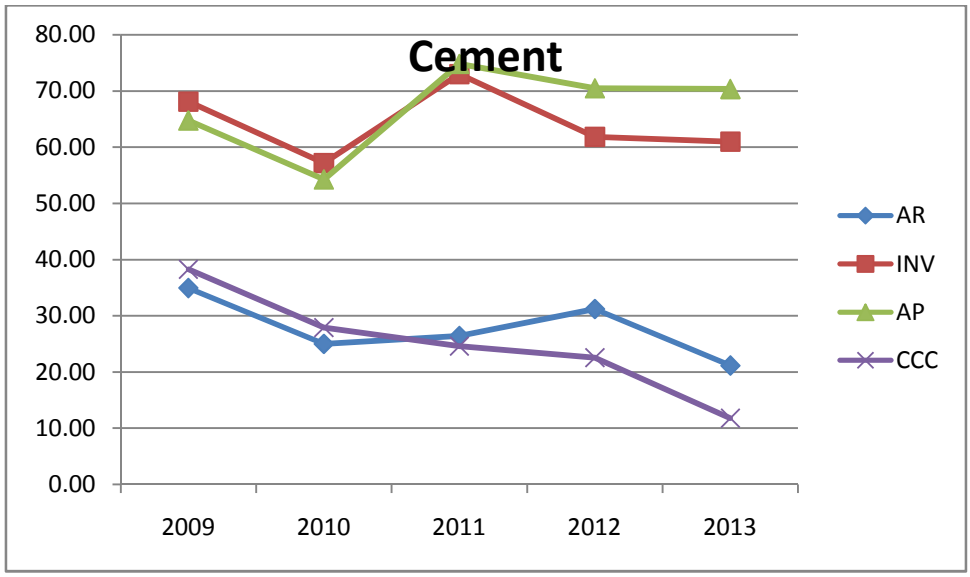


Source: Financial Statements of different companies, 2009-2013

Account receivable period (AR) of Food Industry has shown significant upward trend, starting from 20.36 days in 2009 to 62.69 days in 2013 (Table A.1.a) and except in year 2010 (15.47 days) in other years AR was above that of 2009. Inventory conversion period (INV) did not vary much within the study period and it showed a declining trend. Account payable period (AP) was also within a small range, starting at 60.51 days in 2009 and finishing at 37.1 days in 2013. As cash conversion period (CCC) is the combination of AR, INV and AP, and during the study period only AR varied significantly with strong positive trend, the CCC showed very much similar trend as AR showed.

4.1.1.2 Cement Industry

Figure 2: Year-Wise Working Capital Components of Cement Industry

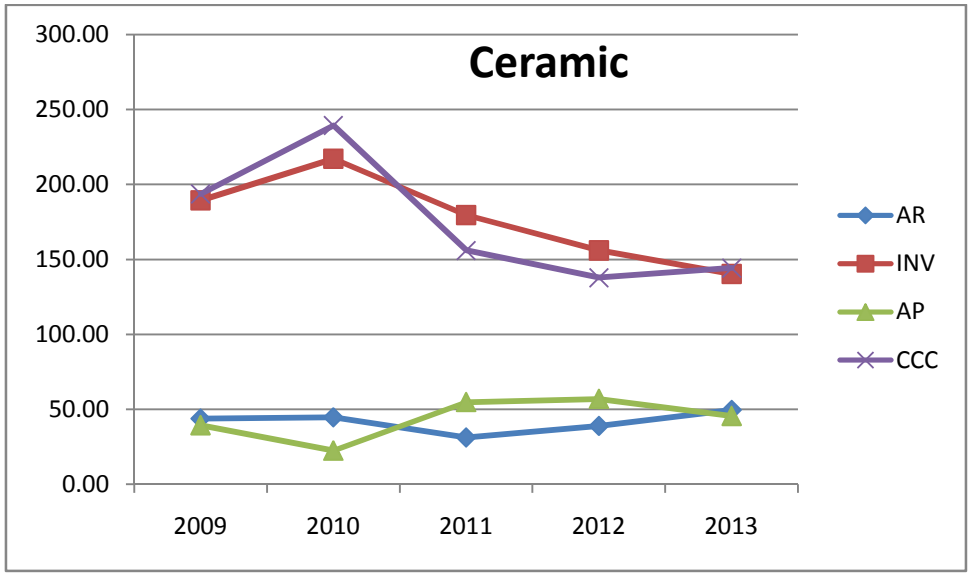


Source: Financial Statements of different companies, 2009-2013

Average accounts payable period values of Cement Industry were on top of inventory conversion period values, accounts payable period values and cash conversion period for most of the study period. From Figure 2 it is very clear that out of the four measures of working capital which are considered in the study, AP and INV have been very much close while AR and CCC stayed hand in hand. Within the study period, AR values did not vary much, started at 34.92 days in 2009 and finished at 21.16 days in 2013 (Table A.1.b) with a sharp declining trend. In 2009, average inventory conversion period was 68.07 days; it declined to 57.15 days in 2010 and ended up with a pretty similar value, 60.97 days in 2013. Accounts payable period in the Cement Industry is high compared to other measures, it started with 64.72 days in 2009, went up to 74.78 days in 2011 and finished at 70.32 days in 2013. The cash conversion period of the Cement Industry is highly affected by AP and due to the declining trend in AR, CCC had a sharp declining trend towards the end of the study period.

4.1.1.3 Ceramic Industry

Figure 3: Year-Wise Working Capital Components of Ceramic Industry

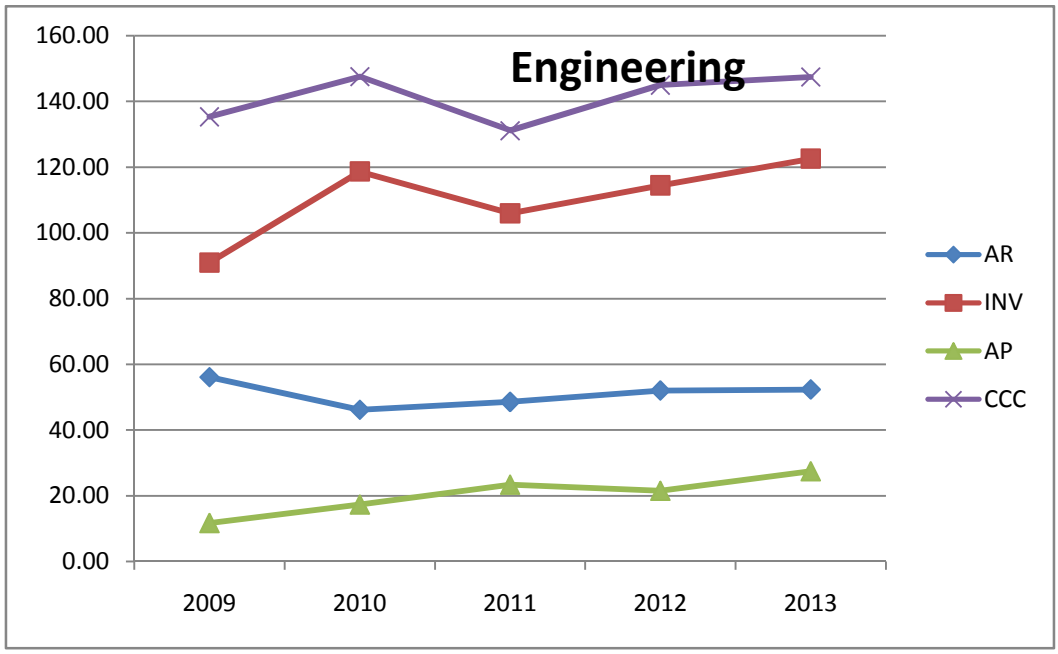


Source: Financial Statements of different companies, 2009-2013

Ceramic Industry had similar pattern to Cement Industry. Here also four measures of working capital were distributed into two groups. However the distribution was different. Inventory conversion period (INV) and cash conversion period stayed together while accounts payable period and accounts receivable period were close. In this industry INV was very high, in 2009 it was 189.23 days and in 2010 it went up further to 217.04 days (Table A.1.c), which was the highest among five years' INV. Towards the end of the study it showed a declining trend, in year 2013 the value was 140.19 days. Accounts receivable period stayed far below the INV, it started with 43.72 days in 2009 and ended with 49.47 days in 2013. Accounts payable period values were very much similar to AR values; it started with 39.34 days in 2009 and ended up with 45.50 day in 2013. As AR and AP stayed together, there have been no significant differences between CCC and INV.

4.1.1.4 Engineering Industry

Figure 4: Year-Wise Working Capital Components of Engineering Industry

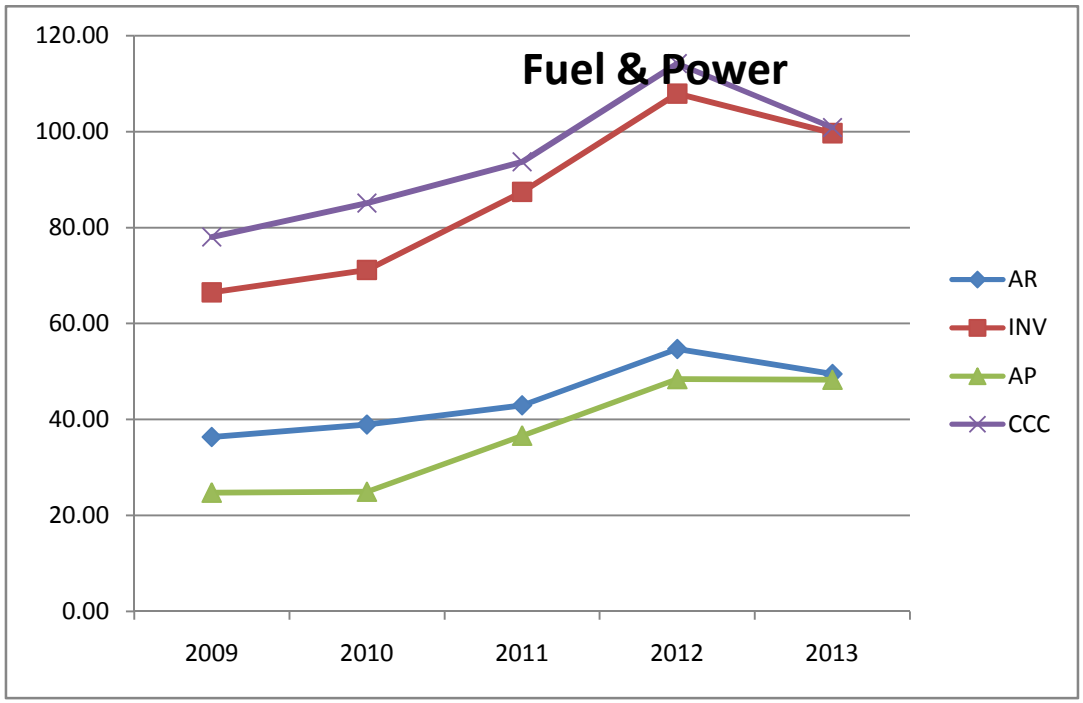


Source: Financial Statements of different companies, 2009-2013

In the Engineering Industry, Cash conversion period stayed on top of all other measures of working capital throughout the study period. Inventory conversion period values were high, started with 90.89 days in 2009 then jumped to 118.64 days in 2010 and ended with 122.5 days in 2013 (Table A.1.d). Cash conversion period values were even higher than INV, in 2009 it was 135.31 days, moved up to 147.51 days, which was the highest level of all five years and finished with 147.42 days in 2013. Accounts receivable period was quite lower than INV; it started with the highest value of 56.05 days in 2009 and finished with 52.30 days in 2013. Accounts payable period values were very low compared to other three measures, it started with 11.64 days in 2009 and finished with 27.39 day. These low AP values and high INV values actually resulted in very high CCC figures.

4.1.1.5 Fuel and Power Industry

Figure 5: Year-Wise Working Capital Components of Fuel & Power Industry

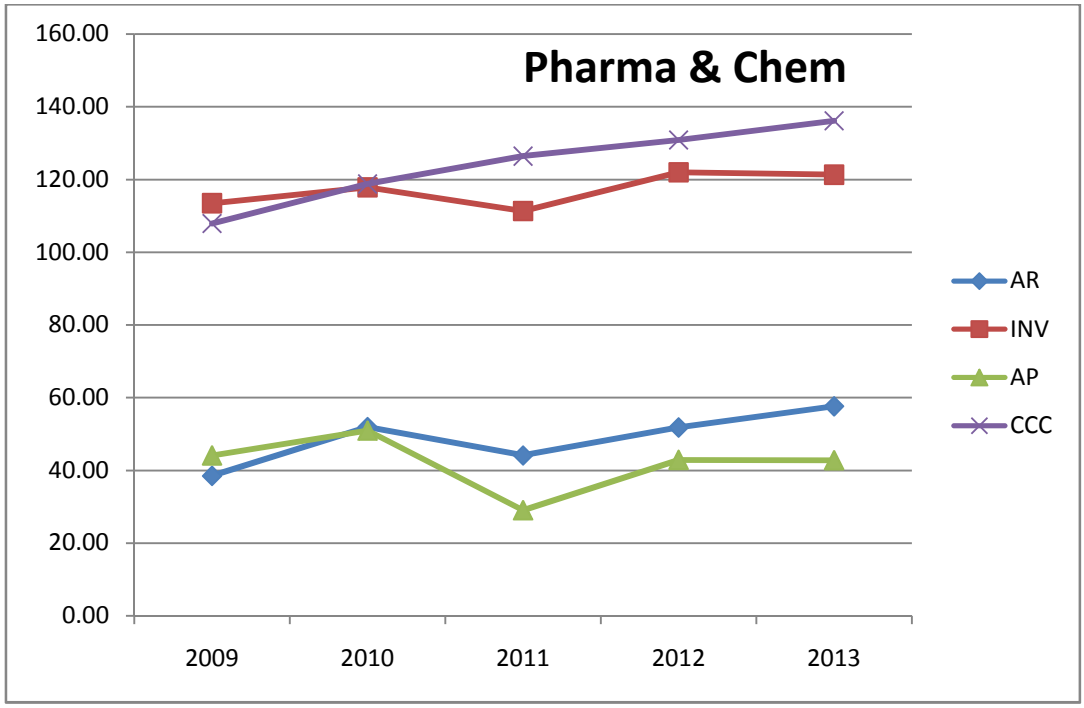


Source: Financial Statements of different companies, 2009-2013

Fuel and Power sector had similar pattern with Engineering in the sense that cash conversion period stayed on top of all other measures throughout the study period. CCC was 78.03 days in 2009 and moved up to the peak level of 114.14 days in 2012 (Table A.1.e) and then declined to 100.82 days in 2013. Inventory conversion period line was almost parallel to the CCC. It was 66.47 days in 2009 and moved up until it reached its peak in 2012 with 107.88 days and reduced to 99.65 days in 2013. Accounts receivable period and Accounts payable period lines were almost mirror images of CCC and INV. In this industry also, the high inventory conversion period and low accounts payable period jointly raised the cash conversion period to high level

4.1.1.6 Pharmaceuticals and Chemical Industry

Figure 6: Year-Wise Working Capital Components of Pharmaceuticals & Chemicals Industry

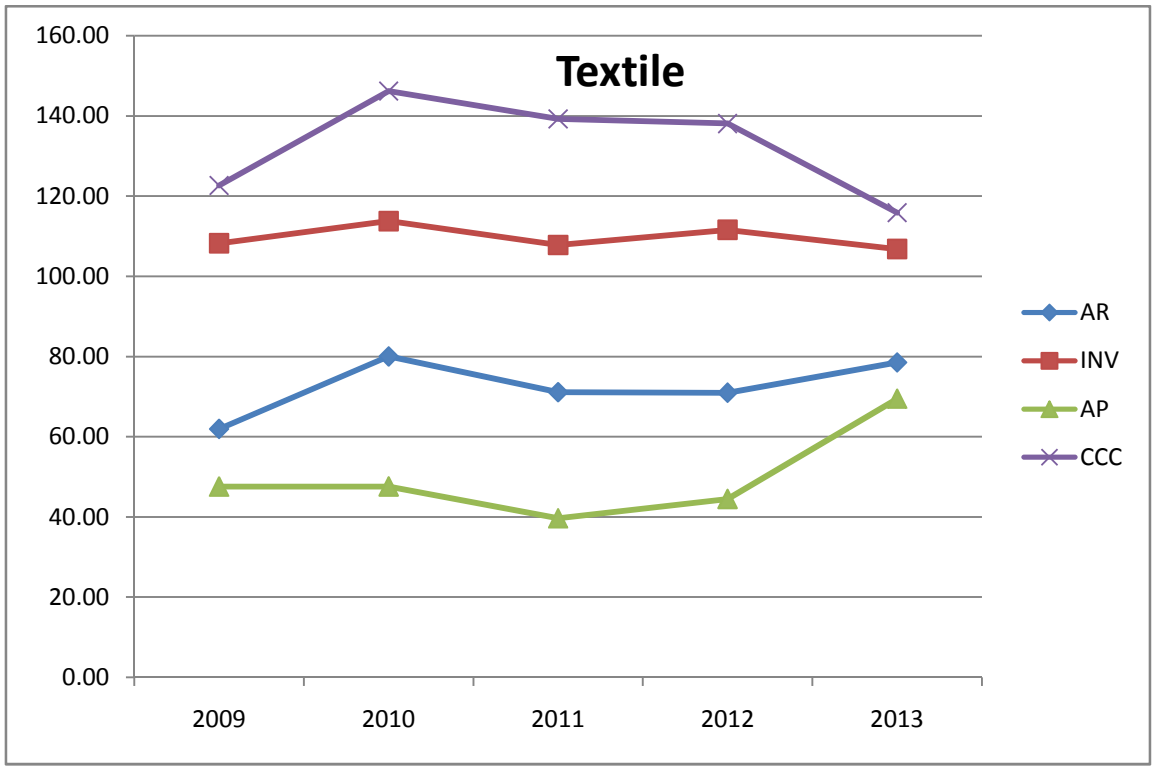


Source: Financial Statements of different companies, 2009-2013

Cash conversion period values in the Pharmaceuticals and Chemicals Industry showed upward trend. In 2009 the value was the lowest, 107.87 days and in 2013 the value was the highest, 136.13 days (Table A.1.f). Like most of the manufacturing companies, pharmaceuticals and chemical companies had high level of inventory, this actually led towards high cash conversion period values.

4.1.1.7 Textile Industry

Figure 7: Year-Wise Working Capital Components of Textile Industry



Source: Financial Statements of different companies, 2009-2013

Textile Industry also had very high cash conversion period, started with 122.64 days in 2009 and moved to 146.17 (Table A.1.g.) days in the next year. Compared to other industries, one noticeable point regarding CCC is that, it is not only very high but also it is quite far away from other measure. In this industry, in addition to high inventory conversion period, the accounts receivable period is also high, which resulted in very high CCC.

4.1.2 Overall Working Capital Management Practice

4.1.2.1 Account Receivable Period

Overall it takes 52 days on average (Table A 2) to collect accounts receivable for Bangladeshi manufacturing companies. In Bangladesh, most of the companies do not sell

on credit to their ultimate consumer; rather they allow credit to whole seller, dealer or retailer. Among all the manufacturing industries (Table A 3.2) companies in the Jute Industry need on an average the highest duration to collect their receivable (86.64 days) and companies in Paper and Printing Industry, on an average, require the lowest time to collect their accounts receivable(9.37 days). Maximum value of AR was found in the Food industry (341.83 days) and minimum value was found in Textile, 0.53 days. Cement Industry and Tannery Industry had quite close average accounts receivable period values, 27.73 days and of 24.05 days respectively. The standard deviation of those two industries was also close- 10.04 days, and 15.85 days respectively. Ceramic Industry on an average collected their receivables in 41.54 days with standard deviation of 17.80 days. Its nearest performer was Fuel and Power Industry, with an average collection period of 44.45 days and standard deviation of 24.78 days. Textile Industry had quite high receivable collection period (72.50 days), while the next on the table was Engineering Industry (51 days) followed by Pharmaceuticals and Chemical Industry with an average collection period of 48.74 days. In terms of year wise mean value (Table A2) the lowest AR was in year 2009 (44.79 days) and the highest AR was in 2013, 58.06 days.

4.1.2.2 Inventory Conversion Period

With regard to the inventory conversion periods by sector, one finds, as one would expect, that the firms dedicated to the Jute Industry, with an average period of 189 days, take the highest time to convert their inventory to sales whereas Cement Industry takes the least (64.20 days). Paper and Printing Industry is quite close to the top, with 184.77 days (Table A3.4) and the next one is Ceramic Industry with 176.37 days. The following one is Tannery Industry with an average collection period of 122.28 days, quite away from the previous one but Pharmaceutical, Engineering and Textile had a quite close average inventory conversion period, 117.17 days, 110.45 days and 109.62 days respectively. Food Industry and Fuel and Power industry had similar inventory conversion practice; 92.42 days and 86.51 days respectively. Even though Jute Industry had the highest average, the standard deviation of inventory conversion period in this industry was quite low (24.05 days) which is very close to the lowest standard deviation of 21.39 days in Cement Industry. The highest standard deviation was present in Textile Industry (78.73 days)

followed by Paper and Printing Industry and Food Industry, 57.7 days and 56.86 days respectively.

The overall average (Table A2) of inventory conversion period is 112.92 days. Among the five years, 2009 had the lowest average inventory conversion period (42.2 days) and 2010 had the highest inventory conversion period (115.72 days).

4.1.2.3 Account Payable Period

Table A3.3 shows descriptive statistics about the accounts payable period of all ten industries. The overall mean value is 42.68 days which means Bangladeshi manufacturing companies are able to defer payments of their suppliers on an average of 43 days. The overall standard deviation is 42.35 days. Among the ten industries, Cement Industry could delay their supplier's payment at highest the level; by 66.91 days and companies in the Engineering Sector made their suppliers' payment earliest (20.21 days). The second highest value of the payable deferral period was in the Jute Industry (63.47 days) followed by Tannery Industry (56.28 days). Though the Jute Industry had the second highest average payment period, they had the lowest standard deviation (10.14 days). The highest standard deviation was present in Food Industry (51.22 days).

In case of year wise data (Table A2), 2011 had the lowest average (39.61 days) and 2013 had the highest average value (49.23 days), 2013 also had the highest standard deviation 47.32 days) and 2011 had the lowest standard deviation.

4.1.2.4 Cash Conversion Period

The overall average of cash conversion period is 45.12 days (Table A2) with a huge gap between the maximum (341.9 days) and minimum (-175.3 days) and also the standard deviation is quite high (71.38 days). The deviation among the years is high again with the highest average CCC of 123.08 days in 2010 and the lowest average CCC of 45.63 days in 2009. Among the ten industries, Jute Industry had the highest average CCC (212.19 days), which means companies in the Jute Industry had to finance its current assets on an average for 212 days. After Jute Industry, Ceramic Industry had the second highest average CCC of

174.14 days, followed by Paper and Printing Industry with an average of 157.08 days. Cement Industry had the lowest average CCC (25 days) and Food Industry had the second lowest average CCC (76.42), more than three times as much as Cement Industry had. Closer to Food Industries are Tannery Industry (90.05) and Fuel and Power Industry (94.36). Rest of the industries had CCC of above 100 days. Textile Industry had the highest standard deviation (107.38) while Jute Industry had the lowest standard deviation (23.43).

4.2 Correlation Analysis

4.2.1 Between Dependent Variable (ROA) and Independent Variables (AR, AP, INV, CCC)

To examine the possible degree of association among the variables those are obtained, the correlation matrix of the dependent and the independent variables is prepared. Table 3 reports the sample Pearson's correlation matrix of the variables employed in the study.

Table 3: Pearson Correlation between Dependent and Independent Variables

		ROA	AR	AP	INV	CCC
ROA	Pearson Correlation	1	-.286**	.005	-.220**	-.309**
	Sig. (2-tailed)		.000	.936	.000	.000
	N	265	265	265	265	265
AR	Pearson Correlation	-.286**	1	.045	.063	.547**
	Sig. (2-tailed)	.000		.467	.309	.000
	N	265	265	265	265	265
AP	Pearson Correlation	.005	.045	1	.065	-.420**
	Sig. (2-tailed)	.936	.467		.293	.000
	N	265	265	265	265	265
INV	Pearson Correlation	-.220**	.063	.065	1	.714**
	Sig. (2-tailed)	.000	.309	.293		.000
	N	265	265	265	265	265
CCC	Pearson Correlation	-.309**	.547**	-.420**	.714**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	265	265	265	265	265

Source: Financial Statements of different companies, 2009-2013

The results in this table show that in terms of magnitude, the correlation coefficient is generally low. However the correlation coefficients for most measures of working capital management are significant. These results are consistent with the view that making payment to suppliers, collecting payments from customers earlier and keeping product or inventory in the stock for lesser time are associated with the increase in profitability. A negative relation between accounts receivable period and Return on Asset (-.286) suggests that higher account receivables balance is associated with lower return on asset may be due to the higher cost of financing accounts receivable. Similar logic can be applied with regards to the relation between inventory conversion period and ROA (Pearson Correlation -.22) as longer inventory conversion periods mean higher investment in inventory and thus higher cost of capital. In the same way the Pearson Correlation value between ROA and cash conversion cycle (-.309) is also valid.

Table 4: Industry Wise Pearson Correlation

		ROA								
		Food	Cement	Ceramic	Engineer.	Pharma	Textile	Fuel & Power	Tannery	Overall
AR	Correl.	-.229	.046	-.475	-.308*	.137	.123	-.609**	-.924**	-.286**
	Sig.	.185	.872	.074	.039	.368	.327	.001	.000	.000
	N	35	15	15	45	45	65	25	10	265
AP	Correl.	.182	.230	.287	-.133	.015	-.061	.045	-.952**	.005
	Sig.	.294	.409	.300	.385	.922	.631	.832	.000	.936
	N	35	15	15	45	45	65	25	10	265
INV	Correl.	-.159	.078	-.162	-.331*	-.430**	-.077	-.106	.638*	-.220**
	Sig.	.361	.784	.564	.026	.003	.542	.616	.047	.000
	N	35	15	15	45	45	65	25	10	265
CCC	Correl.	-.412*	-.225	-.417	-.393**	-.242	.019	-.319	.776**	-.309**
	Sig.	.014	.421	.122	.008	.109	.879	.120	.008	.000
	N	35	15	15	45	45	65	25	10	265

Source: Financial Statements of different companies, 2009-2013

In case of industry-wise correlation,(Table 4) the relation between ROA and AR is negative in Food, Ceramic, Engineering, Fuel & Power and Tannery industries. But in Cement, Pharmaceutical & Chemicals and Textile industries the relationship is positive.

Correlation result between ROA and Account Payable Period shows mixed relationship. The overall correlation is very low (.005) and positive but insignificant. Industry wise correlation between ROA and AP is found negative in three industries (Tannery, Textile and Engineering), out of which only one is significant (Tannery, -.952). Food, Cement, Ceramic, Pharmaceutical& Chemicals, Fuel & Power all showed positive relation between ROA and Accounts payable period, but none of the correlation values are significant.
Taking all the selected companies as a whole, inventory conversion period depicts inverse relationship with ROA. Except Tannery and Cement industries all other industries showed similar relation.

The cash conversion cycle measuring working capital management has an inverse relationship with ROA. This demonstrates that firms which collect cash from their customers as soon as possible, ensuring that they sell their inventories as quickly as possible while taking longer to pay their suppliers, are likely to be more profitable. Industry wise correlation values are also negative except in Tannery and Textile industries.

4.2.2 Within Independent Variables (AR, AP, INV, CCC)

In order to check the presence of autocorrelation and multicollinearity in the data, Durbin Watson (DW) and Variance Inflation factor (VIF) statistics were analyzed and it was found that the statistics are within the limit. Field (2005) suggested that multicollinearity becomes a problem only when the correlation coefficient exceeds 0.80 or 0.90. The results in Table A4 show that none of the correlations between independent variables exceeds these threshold values. However, according to Myers (1990), a certain degree of multicollinearity can still exist even when none of the correlation coefficients are very large. Therefore, the variance inflation factors (VIFs) are also examined (Table A 6) to further test for multicollinearity. The highest VIFs were well below (the highest one is 2.01) the threshold value of 10 suggested by Field (2005) indicating that multicollinearity does not pose a problem to the regressions. Durbin-Watson statistic ranges in value from 0 to 4 with an ideal value of 2 indicating that errors are not correlated, although values from 1.75 to 2.25 may be considered acceptable. Further some authors (Makridakis and

Wheelwright, 1978) consider DW value between 1.5 and 2.5 as acceptable level indicating no presence of collinearity. In all the models developed, DW statistics (Table A7) are close to 2, which suggest that there is no presence of autocorrelation.

4.3 Regression Analysis

4.3.1 Effect of Individual Components:

4.3.1.1 Effect of Average Collection Period on Profitability

Model 1a: $ROA = \beta_0 + \beta_1 LEV + \beta_2 FSIZ + \beta_3 AR + e$

Here ROA is taken as dependent variable and average collection period (AR), Leverage (LEV), and Firm Size (FSIZ) are taken as independent variables. According to the results indicated in Table A8.1, average collection period (p=0.00) is highly significant and has a negative relationship (Beta, -.278) with profitability (return on asset). This negative relationship indicates that as the average collection period increases, the profitability of the firm decreases which means that lower the average collection period, higher will be the profitability. According to the corporate finance theory, less number of days of accounts receivable will add more profits to the firm and the results of this study also coincides with the theory of corporate finance. The R^2 of this model is .141 and adjusted R^2 is .131, which means 14.1 percent of the ROA is explained by the independent variables. The model is also highly significant (p=.00). The other independent variables (LEV and FSIZ) are also highly significant, p values are .02.

4.3.1.2 Effect of Inventory Conversion Period on Profitability

Model 1b: $ROA = \beta_0 + \beta_1 LEV + \beta_2 FSIZ + \beta_3 INV + e$

Here also ROA is taken as dependent variable, only one independent variable is changed, instead of average collection period here inventory conversion period (INV) is taken as

independent variable. Two other independent variables (LEV and FSIZ) remained same. The results of Table A8.2 show a highly significant and negative relationship of inventory conversion period (p=0.00) with profitability (ROA). This shows that shortening the inventory conversion period will lead to higher ROA. This result is quite obvious as shorter inventory conversion period means less idle inventory piled up in a firm and lower investment in current asset, lower cost of fund and thus higher profitability. This result is consistent with the theory of corporate finance that lower number of days of holding inventory will result in higher profitability of firms (Alipour, 2011), (Napompech, 2012) (Vural, Sokmen&Cetenak,2012), (Sharma & Kumar, 2011), (Deloof, 2003), (Lazaridis&Tryfonidis, 2006),(Raheman& Nasr, 2007), (Samiloglu&Dermigunes, 2008), (Raheman&Afza, 2010),(Bagchi, Chakrabarti& Roy, 2012).

Other variables in this model are also highly significant (p values .001 and .000). The R^2 of the model is .122 and adjusted R^2 of the model is .112. The R^2 value shows that in this model inventory conversion period along with Leverage and Firm Size explains 12.2 percent of the movement in ROA. The model is highly significant with F value of 12.14. Leverage and Firm Size are also highly significant with p values of .001 and .000.

4.3.1.3 Effect of Payable Deferral Period on Profitability

Model 1.c: $ROA = \beta_0 + \beta_1 LEV + \beta_2 FSIZ + \beta_3 AP + e$

In Model 1.c, payable deferral period (AP) is taken as independent variable to see the impact of this variable on ROA. The model is significant at 1 percent level (Table A 8.3) and the R^2 is .064 .The variable AP has beta of -.458 which shows that lengthening the average payment period may negatively impact profitability (ROA) while by shortening average payment period, the profitability (ROA) will increase. This result contradicts with the theory of corporate finance which states that greater the payment period of a firm, greater will be its profitability. The reason behind this negative relationship would be that less profitable firms take longer time to pay their bills to creditors. Due to low profits, firms do not have more cash available to them so they delay their payables. Deloof (2003) also proved the same result that less profitable firms stretch their payables. According to Ali (2011) firms stretch their payments to creditors and accrue inventories when they are

making less profit. Thus it can be said that firms earning more profits pay their bills earlier as compared to less profitable firms (Bagchi, Chakrabarti& Roy, 2012), (Alipour, 2011), (Napompech, 2012) (Vural, Sokmen&Cetenak, 2012), (Sharma & Kumar, 2011), (Deloof, 2003), (Padachi, 2006), (Lazaridis&Tryfonidis, 2006), (Raheman& Nasr, 2007), (Samiloglu&Dermigunes, 2008), (Abuzayed, 2012). However the variable AP is insignificant though the other two variables (Leverage and Firm Size) are highly significant.

Trade credit obtained from other firms especially suppliers of goods represent a major source of working capital financing. Therefore, when the prospects of profitability are poor, firms are able to seek an extension on the credit period from their suppliers (Deloof, 2003; Padachi, 2006). This arrangement as pointed in the literature is in most cases acceptable by the supplier as an element of trust is built based on the repeated orders placed by the firms. Indeed, the work of Woodruff (2001) confirmed that the buyer–seller relationship and the information gathered by the 'supplier in the course of doing business are useful in determining repayment prospect'.

4.3.1.4 Effect of Cash Conversion Cycle on Profitability

Model 1.d: $ROA = \beta_0 + \beta_1 LEV + \beta_2 FSIZ + \beta_3 CCC + e$

The combined effect of all the three variables is analyzed by estimating the relationship of profitability and cash conversion cycle in Table A8.4. Results show that cash conversion cycle (p=0.000) is having a significant negative relationship with profitability (ROA). The relationship is consistent with the view that decrease in cash conversion cycle positively impacts the profitability while an increase in cash conversion cycle will negatively affect profitability. This relationship between cash conversion cycle and return on assets has a logical base and was expected. This regression result is consistent with the findings of many other studies over the world including Lazaridis and Tryfonidis (2006) that a decrease in the cash conversion cycle will generate more profits for a company.

4.3.1.5 Effect of Control Variables on Profitability

Leverage and size are control variables used in this study. From Model 1.a to Model 1.d, in all four models Leverage is showing negative relationship with ROA and Firm Size is showing positive relationship with ROA. This shows that decreasing leverage will have a positive impact on profitability and increasing size will positively influence profitability (Bagchi, Chakrabarti& Roy, 2012) (Alipour, 2011) (Napompech, 2012) (Vural, Sokmen&Cetenak, 2012) (Gill, Biger&Mathur, 2010) (Gill, 2011) (Sharma & Kumar, 2011) (Samiloglu&Dermigunes, 2008) (Mathuva, 2010) (Raheman& Nasr, 2007).

4.3.2 Combined Effect

4.3.2.1 Model 1.e

$$ROA = \beta_0 + \beta_1 AR + \beta_2 INV + \beta_3 AP + \beta_4 CCC + \beta_5 FG + \beta_6 CR + \beta_7 LEV + \beta_8 FSIZ + e$$

Accounts receivable period, inventory conversion period, accounts payable period, cash conversion period, Firm's Growth (growth rate of sales), Current Ratio, Leverage, Firm Size have been regressed upon Return on Assets to investigate whether working capital management does result in any significant change in profitability of the firms. On Table A8.5 the result of this regression shows that the value of multiple R is 0.44 which means that there exists 44% correlation among Return on Assets, accounts receivable period, inventory conversion period, accounts payable period, cash conversion period, Firm's Growth (growth rate of sales), Current Ratio, Leverage, and Firm Size. The value of coefficient of determination shows that 19.4% variation in Return on Assets is explained by accounts receivable period, inventory conversion period, accounts payable period, cash conversion period, Firm's Growth (growth rate of sales), Current Ratio, Leverage, and Firm Size. Thus, working capital management for the firms is not strongly associated with the profitability of the firms because there are other factors that may significantly influence this association. In Table 7.5, the value of F is statistically significant at 5% levels of significance. The results of this regression indicate that the coefficient of accounts receivable is negative (Beta= -.098) and is not highly significant as p = 0.177. It implies

that the increase or decrease in accounts receivable will not significantly affect profitability of the firm. Account payable period is highly significant (p=.023), which implies that the duration of account payable significantly affect the profitability. But the beta coefficient of this variable is negative, which means higher account payable will lower profit, it can be said in other way, less profitable firms delay their dues. Cash conversion period is also highly significant (p=.000) with a negative beta value, which implies, in this model the relationship between working capital and profitability is quite obvious. The current ratio which is a traditional measure of liquidity has not a significant relationship with profitability and also the relationship is positive. Here debt ratio is used as a proxy for leverage; it shows a significant (p=.002) negative relationship with the dependent variable, which means that, when leverage of the firm increases, it will adversely affect its profitability. The variable Firm's Growth is insignificant and also showing negative relationship which is quite unusual in the sense that growing firms should have higher profitability.

On the other hand log of sales (Firm Size) used as proxy for size of a company shows a significant positive relationship with profitability which means that bigger size firms have more profitability compared to firms of smaller size. Results of this model are inconsistent due to fact that AR is showing insignificant impact but in previous model it was significant, Firm Growth is showing negative and insignificant relationship. To make the model more logical another regression is run excluding Firm Growth and Current Ratio as those variables are insignificant in this model.

4.3.2.2 Model 1.f

$$\mathbf{ROA = \beta_0 + \beta_1 AR + \beta_2 AP + \beta_3 CCC + \beta_4 LEV + \beta_5 FSIZ} + e$$

This regression is run excluding Current Ratio and Firm's Growth as independent variables. The other variables are the same as they have been in the previous regression. Table A8.6 shows that the coefficient of account receivable period in days is negative but still not highly significant (p=.182). All the other variables are also significantly affecting profitability as in case of first regression. In this model except Firm Size all other independent variables showing negative relationship with ROA, which implies increase in

sales has a positive impact on profitability while all the other variables like account receivable period, accounts payable period, cash conversion period, debt ratio have a significant negative effect on profitability of the firm. The Adjusted R^2 is 17.6%. The F-statistic has a value equal to (12.276) that reflects the high significance of the model or significance of R-square. Compared to the previous result Adjusted R^2 value has slightly increased in this regression.

4.3.2.3 Model 1.g

$$\mathbf{ROA = \beta_0 + \beta_1\ AR + \beta_2\ INV + \beta_3\ AP + \beta_4\ LEV + \beta_5\ FSIZ} + e$$

Cash conversion period is combination of account receivable period, inventory conversion period and account payable period. To examine the effect of individual working capital measures another regression is run after only excluding cash conversion period from previous model. The other variables are same as they have been in the last regression. An important aspect of this model is that inventory conversion period is not automatically excluded by the software. The result indicates that except accounts payable period all other variables are highly significant. Similar to the previous model apart from Firm Size all other variables have negative intercepts. The negative relationship between the average payment period and profitability indicates that the less profitable firms wait longer to pay their bills. The adjusted R^2 is exactly same as the previous one (.176) even though cash conversion period is not taken this time. The F-statistic value is again 12.276. It also reflects the high significance of this model. As account payable period is insignificant in this model, another regression is run by excluding this variable.

4.3.2.4 Model 1.h

$$\mathbf{ROA = \beta_0 + \beta_1\ AR + \beta_2\ INV + \beta_3\ LEV + \beta_4\ FSIZ} + e$$

In this regression, accounts payable period is excluded as it was insignificant in the previous model. Result shows that adjusted R^2 has again improved slightly; adjusted R^2 in this model is .179 (Table A8.8) even though R^2 remained same. Another important aspect

of this model is all the independent variables are highly significant and are showing the expected relationship with ROA.

4.3.2.5 Model 2

$$\mathbf{TQ= \beta_0 + \beta_1 AR + \beta_2 INV + \beta_3 AP + \beta_4 CCC + \beta_5 FG + \beta_6 CR + \beta_7 LEV + \beta_8 FSIZ + e}$$

To identify how the working capital management affects the market value of a Bangladeshi manufacturing company, Tobin's q is taken as dependent variable in this regression. Here account receivable period is automatically excluded by software and the remaining independent variables are inventory conversion period, account payable period, cash conversion period, firm's growth, current ratio, leverage and firm size. The result in Table A8.9 shows that only account payable period and cash conversion period are significant at 10% level. The R^2 and Adjusted R^2 are also very poor; .045 and .019 respectively. The F value of the model is 1.711 showing that the model is not significant (p=.107). So it can be said from this result that in Bangladesh market specially in case of manufacturing companies, working capital management is not highly affecting the value of the company.

4.3.3 Moderating Effect

4.3.3.1 Model 3.a

$$\mathbf{ROA= \beta_0 + \beta_1 AR*FG + \beta_2 INV*FG + \beta_3 AP*FG + \beta_4 CCC*FG + \beta_5 CR + \beta_6 LEV + \beta_7 FSIZ + e}$$

To examine the moderating effect of firm's growth on profitability (ROA), each of the working capital variables is multiplied by the variable FG (firm growth) and the regression is run. Here R^2 is very low (.079) but the model is significant as the F value is 3.134 (Table A8.10) and p value is .003. However all the independent variables in this model are insignificant, except leverage which is a control variable.

4.3.3.2 Model 3.b

$$TQ = \beta_0 + \beta_1 AR*FG + \beta_2 INV*FG + \beta_3 AP*FG + \beta_4 CCC*FG + \beta_5 CR + \beta_6 LEV + \beta_7 FSIZ + e$$

Here again the same model is run to see the moderating effect but this time the dependent variable is Tobin's q. result of this regression (Table A8.11) shows that the independent variables are not explaining the pattern of the dependent variable as the Adjusted R^2 is -.010. The model is also not significant as all the independent variables are highly insignificant.

4.4 Hypothesis Test Results

4.4.1 Hypothesis 1: t statistic value for AR (account receivable period) is equal to -4.85 (Table A8.1) and Ho hypothesis is rejected in the confidence level of 0.95. In other words, there is a significant negative relationship between AR and return on assets (ROA). It means if collections are made quickly profitability is enhanced.

4.4.2 Hypothesis 2: t statistic value is equal to – 4.033 (Table A8.7) for INV (inventory conversion period) and Ho hypothesis is rejected in the confidence level of 0.95. In other words, there is a negative significant relationship between inventory conversion period and return on assets. By speeding inventory conversion, profitability can be improved.

4.4.3 Hypothesis 3: t statistic value is equal to – .072 (Table A8.7) for variable of AP (Account Payable Period) and Ho Hypothesis is not rejected in the confidence level of 0.95. In other words there is an insignificant relationship between account payable period and return on asset.

4.4.4 Hypothesis 4: According to Table A8.5, t statistic value for CCC (cash conversion cycle) is – 4.061 and at the confidence level of 0.95. So Ho hypothesis is rejected. Therefore, it can be concluded that there is a negative significant relation between the cash conversion cycle and return on assets. This relationship between cash conversion cycle and return on assets has a logical base and was expected. On the other hand, changes in cash

conversion cycle lead to changes in firm's financial resources and access to financial resources is also one of the effective factors on profitability.

4.4.5 Hypothesis 5: From Table A8.9 it can be seen that the t value for the variable FSIZ (Firm Size) is .325 which is insignificant. So the null hypothesis could not be rejected in this case.

4.4.6 Hypothesis 6: On Table A 8.10 all the independent variables such as AR, INV, CCC are insignificant which were significant before. So the null hypothesis in this case could not be rejected.

4.5 Findings:

1) Companies in Jute Industry allow their customers on an average the highest time to pay their payables. They need on an average 86.64 days to collect their receivables. Paper & Printing Industry require the lowest time (9.37 days) to collect their trade credit. However the overall average is 52 days. This means that Bangladeshi manufacturing companies are financing their customers on an average 52 days of their cost of sales.
2) Correlation between Return on Asset and accounts receivable period (AR) is negative (-.292) and highly significant. From regression it is found that accounts receivable period has negative effect on profitability. Hypothesis test result also suggests a significant negative impact of AR on ROA
3) Jute Industry, with an average inventory conversion period of 189 days, takes the highest time to convert their inventory to sales whereas Cement Industry takes the least (64.20 days). Paper and Printing Industry is quite close to the top, with 184.77 days and the next one is Ceramic Industry with 176.37 days. The overall average of Inventory Conversion Period is 112.92 days. It means Bangladeshi Manufacturing companies take on an average 113 days to convert their inventory into finished goods.
4) Negative correlation (-.211) is found between Return on Asset and inventory conversion period and the correlation is highly significant (p= -.000). From regression result it is found that inventory conversion period has negative effect on profitability of Bangladeshi manufacturing companies. Hypothesis test result also supports this finding.
5) The overall mean value of accounts payable period is 42.68 days, which means Bangladeshi manufacturing companies are able to defer payments of their suppliers on an average of 43 days.
6) Among the ten industries, Cement Industry could delay their supplier's payment at the highest level; by 66.91 days and companies in the Engineering Sector made their suppliers' payment the earliest (20.21 days). In case of year wise accounts payable data, year 2011 had the lowest average account payable period (39.61

days) and year 2013 had the highest average accounts payable period value (49.23 days).

7) Correlation between Return on Asset and account payable period is positive (0.005) but not significant. The regression result also suggests that accounts payable period has no significant impact on ROA.
8) The overall average of Cash Conversion Period (CCC) is 45.12 days with a huge gap between the maximum (341.9 days) and minimum (-175.3 days). This suggests that on an average Bangladeshi Manufacturing companies take 45 days from their payment for raw materials to receipt against sales. However this practice varies a lot from industry to industry. Among the ten industries taken into the study, Jute Industry had the highest average CCC (212.19 days), Cement Industry had the lowest average CCC (25 days). After Jute Industry, Ceramic Industry had the second highest average CCC of 174.14 days, followed by Paper and Printing Industry with an average of 157.08 days. A negative (-.328) and highly significant (p=.000) relation is found between Return on Asset and cash conversion period. Based on regression result it can be said that cash conversion period negatively affects profitability of Bangladeshi manufacturing companies.
9) Firm growth has no significant moderating effect on the profitability of Bangladeshi manufacturing companies.

4.6 Conclusion and Recommendations:

Working capital management is an important part of financial management decisions in all firms. The ability of the firm to operate for longer durations depends on a proper trade-off between management of investment in long-term and short-term funds (working capital). Financial managers around the world use their immaculate talent to make financing, capital budgeting and working capital decisions in a fashion that adds value to the organization. Investors' interest largely looms around the required rates of returns. Modern business scenario is a paced pitch where a fast growing corporate cultures demands financial managers to adopt strategies aimed at providing economic benefits to its shareholders and towards serving the welfare interest of the wider community. Businesses are shaping the modern economies of the world and the goal of welfare and economic benefits looks far from possible. There is a greater need of using indigenous studies to understand local financial practices and systems.

The researcher has studied the effect of different variables of working capital management including the Average collection period, Inventory turnover in days, Average payment period, Cash conversion cycle, on profitability of Bangladeshi manufacturing companies and Current ratio, financial leverage, sales growth, leverage and size of the firm (measured in terms of natural logarithm of sales) have been used as control variables. This study found a negative and significant relationship of average collection period and profitability indicating that shorter the average collection period, greater will be the profitability also a negative and significant relationship is found between profitability and average age of inventory showing that greater the average age of inventory, lower will be the profits of the firm. But the relationship between the average payment period and profitability is negative and insignificant showing that more profitable firms pay their bills earlier as compared to less profitable firms. Moreover cash conversion cycle is having negatively significant relationship with profitability.

Based on the findings of this study following actions can be suggested for the practicing managers of Bangladeshi manufacturing companies:

1) Companies in the Jute Industry should take steps to expedite their collection to enhance their profitability. They may use cash discount to motivate their customers for early payment. However cost of providing this discount must be compared with the reduced cost of capital due to the early payment by customer.
2) Bangladeshi manufacturing companies might try to minimize their account receivable collection period. They should also use different tools such as Aging Fraction Statistics, Ratio of Receivable Outstanding, and Payment Proportion to monitor accounts receivable.
3) Companies in Jute Industry, Paper and Printing Industry, Cement Industry should be more cautious about quicker conversion of inventory into finished goods. They might use inventory management models such as Basic EOQ Model, Production Order Quantity Model to reduce investment in inventory while maintaining a given level of sales.
4) Companies in other industries should also try to convert their inventories into finished goods as quickly as possible because inventory conversion period has negative impact on ROA.
5) Account payable is almost a free source of finance for a company. So Bangladeshi manufacturing companies may attempt to use this source as long as this practice does not affect the reputation of the company. Companies should engage in relationship with those suppliers who allow long credit time period.
6) Companies in the Cement Industry may continue their practice of deferring suppliers' payment if it does not hamper their relationship with the suppliers.
7) As the impact of account payable period on profitability is insignificant companies may also use their judgment in using account payable as a source of financing.
8) There exists a negative relationship between cash conversion cycle and profitability. Companies in order to improve their operation and increase in shareholder's wealth must adopt policies and plans to reduce cash conversion period (if no disorder is created in the company operation). The study suggests that managers of these firms should spend more time to manage cash conversion cycle of their firms and make strategies of efficient management of working capital. They

should also take help from external sources i.e. financial consultants and experts to plan the efficient and optimum management of cash conversion cycle and improve performance and profitability of these firms

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Appendix

Table A.1.a: Year-Wise Working Capital Components

Industry	Food				
Year	2009	2010	2011	2012	2013
AR	20.36	15.47	21.57	34.49	62.69
INV	104.66	92.26	95.54	87.64	82.00
AP	60.51	49.23	48.69	39.01	37.10
CCC	64.51	58.49	68.42	83.12	107.59

Table A.1.b: Year-Wise Working Capital Components

Industry	Cement				
Year	2009	2010	2011	2012	2013
AR	34.92	24.99	26.40	31.18	21.16
INV	68.07	57.15	72.98	61.82	60.97
AP	64.72	54.25	74.78	70.45	70.32
CCC	38.26	27.89	24.59	22.55	11.80

Table A.1.c: Year-Wise Working Capital Components

Industry	Ceramic				
Year	2009	2010	2011	2012	2013
AR	43.72	44.59	31.15	38.80	49.47
INV	189.23	217.04	179.48	155.89	140.19
AP	39.34	22.44	54.73	56.87	45.50
CCC	193.61	239.20	155.90	137.82	144.16

Table A.1.d: Year-Wise Working Capital Components

Industry			**Engineering**		
Year	2009	2010	2011	2012	2013
AR	56.05	46.13	48.53	52.00	52.30
INV	90.89	118.64	105.87	114.39	122.50
AP	11.64	17.26	23.32	21.43	27.39
CCC	135.31	147.51	131.09	144.95	147.42

Table A.1.e: Year-Wise Working Capital Components

Industry			**Fuel & Power**		
Year	2009	2010	2011	2012	2013
AR	36.32	38.90	42.93	54.67	49.45
INV	66.47	71.14	87.41	107.88	99.65
AP	24.76	24.95	36.63	48.41	48.28
CCC	78.03	85.10	93.71	114.14	100.82

Table A.1.f: Year-Wise Working Capital Components

Industry			**Pharmaceuticals &Chemicals**		
Year	2009	2010	2011	2012	2013
AR	38.47	51.85	44.06	51.76	57.58
INV	113.47	117.81	111.33	121.95	121.31
AP	44.07	50.91	28.98	42.85	42.76
CCC	107.87	118.75	126.41	130.86	136.13

Table A.1.g: Year-Wise Working Capital Components

Industry			**Textile**		
Year	2009	2010	2011	2012	2013
AR	61.94	80.00	71.10	70.96	78.50
INV	108.23	113.74	107.78	111.56	106.79
AP	47.53	47.57	39.64	44.44	69.44
CCC	122.64	146.17	139.24	138.08	115.84

Table A 2: Descriptive Statistics (Year Wise & Overall)

	2009				2010				2011				2012				2013				Overall			
	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
AR	.21	157.53	44.79	38.15	.26	143.37	48.32	43.35	.31	154.28	45.77	38.88	.33	153.56	51.24	42.81	.46	341.83	58.06	60.33	.21	341.83	51.64	45.33
INV	.48	187.49	42.2	44.1	4.21	253.82	115.72	67.5	6.59	235.10	109.27	55.95	8.34	238.84	113.68	57.91	.12	266.96	110.23	62.79	.12	277.15	111.19	61.66
AP	.00	208.92	41.36	46.85	.00	190.01	40.96	42.55	.00	142.47	39.61	34.53	.00	168.03	42.23	40.15	.00	169.75	49.23	47.32	.00	208.92	42.68	42.35
CCC	-149.9	300.95	45.63	75.71	-3.38	321.06	123.08	92.05	-1.53	318.02	115.42	77.58	-34.49	338.97	122.69	84.86	-80.87	355.22	119.07	96.97	-80.87	355.22	118.15	86.54

Table A 3.1: Descriptive Statistics (ROA)

	N	Minimum	Maximum	Mean	Std. Deviation
ROA_FOOD	35	-.01	.51	.1589	.15455
ROA_CEM	15	.00	.23	.1173	.06943
ROA_CER	15	-.01	.11	.0500	.03836
ROA_ENG	45	-.01	.47	.1013	.08248
ROA_PH	45	.01	.25	.0969	.05151
ROA_TEX	65	-.04	.16	.0348	.03088
ROA_FUEL	25	.03	.31	.1348	.08053
ROA_JUTE	5	.01	.02	.0120	.00447
ROA_TAN	10	.05	.26	.1610	.09291
ROA_PAPER	5	.02	.09	.0400	.02915
Valid N (listwise)	5				

Table A 3.2:Descriptive Statistics (AR)

	N	Minimum	Maximum	Mean	Std. Deviation
AR_FOOD	35	1.25	341.83	30.9149	61.02696
AR_CEM	15	6.45	48.16	27.7293	10.04391
AR_CER	15	23.09	83.73	41.5467	17.80014
AR_ENG	45	1.02	177.69	51.0020	52.20255
AR_PH	45	.21000	179.26000	48.7446667	42.71767750
AR_TEX	65	.53	171.42	72.5005	42.47113
AR_FUEL	25	5.28	82.38	44.4556	24.78525
AR_JUTE	5	75.41	97.28	86.6400	9.18342
AR_PAPER	5	.65	26.96	9.3720	10.41487
AR_TAN	10	6.59	50.53	24.0540	15.85600
Valid N (listwise)	5				

Table A 3.3:Descriptive Statistics (AP)

	N	Minimum	Maximum	Mean	Std. Deviation
AP_FOOD	35	.69	208.92	46.9080	51.21845
AP_CEM	15	19.27	107.13	66.9073	34.29470
AP_CER	15	.00	83.90	43.7760	31.29627
AP_ENG	45	.00	122.30	20.2064	24.83716
AP_PH	45	1.80	190.01	41.9151	42.85102
AP_TEX	65	.18	154.37	49.7251	47.52085
AP_FUEL	25	.00	169.75	36.6048	46.77755
AP_JUTE	5	52.23	77.87	63.4700	10.14595
AP_PAPER	5	6.01	68.26	37.0580	22.19695
AP_TAN	10	29.51	97.23	56.2790	26.42286

Table A 3.4:Descriptive Statistics (INV)

	N	Minimum	Maximum	Mean	Std. Deviation
INV_FOOD	35	.12	205.20	92.4209	56.85766
INV_CEM	15	25.76	91.82	64.1980	21.39779
INV_CER	15	108.50	277.15	176.3687	46.41107
INV_ENG	45	32.96	208.02	110.4569	41.94248
INV_PH	45	23.82	250.55	117.1727	57.66605
INV_TEX	65	6.59	270.95	109.6183	78.73384
INV_FUEL	25	35.32	125.03	86.5108	28.21676
INV_JUTE	5	166.44	224.34	189.0180	24.05148
INV_PAPER	5	109.66	250.15	184.7700	57.69826
INV_TAN	10	14.31	163.09	122.2760	43.71542
Valid N (listwise)	5				

Table A 3.5:Descriptive Statistics (CCC)

	N	Minimum	Maximum	Mean	Std. Deviation
CCC_FOOD	35	-9.62	341.15	76.4277	78.63716
CCC_CEM	15	-6.85	71.25	25.0200	25.69649
CCC_CER	15	91.53	319.01	174.1380	59.84910
CCC_ENG	45	22.68	321.06	141.2540	67.93607
CCC_PH	45	-23.01	270.50	124.0036	80.93156
CCC_TEX	65	-80.87	355.22	132.3937	107.37846
CCC_FUEL	25	-34.49	178.74	94.3592	63.09729
CCC_JUTE	5	190.88	240.96	212.1880	23.43528
CCC_PAPER	5	109.95	211.64	157.0820	45.19248
CCC_TAN	10	-19.16	132.11	90.0500	49.46024

Table A 4: Pearson Correlation between Dependent and Independent Variables

		ROA	AR	AP	INV	CCC
ROA	Pearson Correlation	1	-.286**	.005	-.220**	-.309**
	Sig. (2-tailed)		.000	.936	.000	.000
	N	265	265	265	265	265
AR	Pearson Correlation	-.286**	1	.045	.063	.547**
	Sig. (2-tailed)	.000		.467	.309	.000
	N	265	265	265	265	265
AP	Pearson Correlation	.005	.045	1	.065	-.420**
	Sig. (2-tailed)	.936	.467		.293	.000
	N	265	265	265	265	265
INV	Pearson Correlation	-.220**	.063	.065	1	.714**
	Sig. (2-tailed)	.000	.309	.293		.000
	N	265	265	265	265	265
CCC	Pearson Correlation	-.309**	.547**	-.420**	.714**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	265	265	265	265	265

Table A5: Industry Wise Pearson Correlation

		ROA								
		Food	Cement	Ceramic	Engineer.	Pharma	Textile	Fuel & Power	Tannery	Overall
AR	Correl.	-.229	.046	-.475	-.308*	.137	.123	-.609**	-.924**	-.286**
	Sig.	.185	.872	.074	.039	.368	.327	.001	.000	.000
	N	35	15	15	45	45	65	25	10	265
AP	Correl.	.182	.230	.287	-.133	.015	-.061	.045	-.952**	.005
	Sig.	.294	.409	.300	.385	.922	.631	.832	.000	.936
	N	35	15	15	45	45	65	25	10	265
INV	Correl.	-.159	.078	-.162	-.331*	-.430**	-.077	-.106	.638*	-.220**
	Sig.	.361	.784	.564	.026	.003	.542	.616	.047	.000
	N	35	15	15	45	45	65	25	10	265
CCC	Correl.	-.412*	-.225	-.417	-.393**	-.242	.019	-.319	.776**	-.309**
	Sig.	.014	.421	.122	.008	.109	.879	.120	.008	.000
	N	35	15	15	45	45	65	25	10	265

Table A 6: Collinearity Statistics

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.123	.082		-1.492	.137		
	AR	.000	.000	-.098	-1.353	.177	.602	1.660
	AP	.000	.000	-.157	-2.283	.023	.663	1.509
	CCC	.000	.000	-.328	-4.061	.000	.480	2.085
	FG	-.003	.008	-.018	-.307	.759	.955	1.047
	CR	.002	.003	.047	.803	.423	.896	1.116
	LEV	-.027	.009	-.180	-3.155	.002	.961	1.040
	FSIZ	.031	.009	.201	3.381	.001	.888	1.126

a. Dependent Variable: ROA

Table A7: Durbin-Watson Statistics

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.440[a]	.194	.172	.08283	2.167

a. Predictors: (Constant), FSIZ, CCC, LEV, FG, CR, AP, AR

b. Dependent Variable: ROA

Table A 8.1 : Regression Result of Model 1

Parameter	**LEV**	**FSIZ**	**AR**
Coefficient	-.183	.185	-.278
t-value	-3.166	3.188	-4.849
p-value	.002	.002	.000
R^2	.141		
Adj. R^2	.131		
F-Value	14.236		
F-Significance	.000[b]		

Table A 8.2: Regression Result of Model 2

Parameter	LEV	FSIZ	INV
Coefficient	-.196	.218	-.245
t-value	-3.345	3.705	-4.196
p-value	.001	.000	.000
R^2	.122		
Adj. R^2	.112		
F-Value	12.136		
F-Significance	.000[b]		

Table A 8.3: Regression Result of Model 3

Parameter	LEV	FSIZ	AP
Coefficient	-.194	.193	-.028
t-value	-3.207	3.161	-.458
p-value	.002	.002	.648
R^2	.064		
Adj. R^2	.053		
F-Value	5.946		
F-Significance	.001[b]		

Table A 8.4: Regression Result of Model 4

Parameter	LEV	FSIZ	CCC
Coefficient	-.185	.188	-.305
t-value	-3.221	3.283	-5.357
p-value	.001	.001	.000
R^2	.156		
Adj. R^2	.146		
F-Value	16.083		
F-Significance	.000[b]		

Table A 8.5: Regression Result of Model 5

Parameter	AR	AP	CCC	FG	CR	LEV	FSIZ
Coefficient	-.098	-.157	-.328	-.018	.047	-.180	.201
t-value	-1.353	-2.283	-4.061	-.307	.803	-3.155	3.381
p-value	.177	.023	.000	.759	.423	.002	.001
VIF	1.660	1.509	2.085	1.047	1.116	1.040	1.126
R^2	.194						
Adj. R^2	.172						
F-Value	8.834						
F-Significance	.000[b]						
D-W Stat.	2.167						

Table A 8.6: Regression Result of Model 6

Parameter	AR	AP	CCC	LEV	FSIZ
Coefficient	-.096	-.160	-.320	-.187	.213
t-value	-1.339	-2.385	-4.033	-3.307	3.700
p-value	.182	.018	.000	.001	.000
VIF	1.653	1.450	2.011	1.021	1.058
Multiple R	.438[a]				
R^2	.192				
Adj. R^2	.176				
F-Value	12.276				
F-Significance	.000[b]				
D-W Stat.	2.173				

Table A 8.7: Regression Result of Model 7

Parameter	AR	INV	AP	LEV	FSIZ
Coefficient	-.264	-.228	-.004	-.187	.213
t-value	-4.699	-4.033	-.072	-3.307	3.700
p-value	.000	.000	.942	.001	.000
VIF	1.008	1.021	1.031	1.021	1.058
Multiple R	.438[a]				
R^2	.192				
Adj. R^2	.176				
F-Value	12.276				
F-Significance	.000[b]				
D-W Stat.	2.173				

Table A 8.8: Regression Result of Model 8

Parameter	AR	INV	LEV	FSIZ
Coefficient	-.264	-.228	-.187	.212
t-value	-4.716	-4.048	-3.313	3.741
p-value				
VIF	1.006	1.019	1.019	1.033
Multiple R	.438[a]			
R^2	.192			
Adj. R^2	.179			
F-Value	15.403			
F-Significance	.000[b]			
D-W Stat.	2.174			

Table A 8.9: Regression Result of Model 9, Dependent Variable Tobin's q

Parameter	INV	AP	CCC	FG	CR	LEV	FSIZ
Coefficient	.050	-.175	-.189	.099	-.063	-.072	.023
t-value	.607	-2.118	-1.947	1.600	-.977	-1.156	.352
p-value	.545	.035	.053	.111	.330	.249	.725
VIF							
R^2	.045						
Adj. R^2	.019						
F-Value	1.711						
F-Significance	.107						

Table A 8.10: Regression Result of Model 9, Dependent Variable ROA

Parameter	AR*FG	INV*FG	AP*FG	CCC*FG	CR	LEV	FSIZ
Coefficient	-.158	.146	.168	-.150	.006	-.188	.178
t-value	-.429	1.501	.454	-1.618	.094	-3.082	2.827
p-value	.668	.134	.650	.107	.926	.002	.005
R^2	.079						
Adj. R^2	.054						
F-Value	3.134						
F-Significance	.003						

Table A 8.11: Regression Result of Model 9, Dependent Variable Tobin's q

Parameter	ARF*G	INV*FG	AP*FG	CCC*FG	CR	LEV	FSIZ
Coefficient	**.021**	**.061**	**.035**	**-.011**	**-.062**	**-.072**	**-.006**
t-value	**.056**	**.608**	**.092**	**-.119**	**-.978**	**-1.140**	**-.089**
p-value	**.955**	**.544**	**.927**	**.906**	**.329**	**.255**	**.929**
R^2	**.017**						
Adj. R^2	**-.010**						
F-Value	**.640**						
F-Significance	**.722**						