

Relationship between Working Capital Management and Profitability in Context of Manufacturing Industries in Bangladesh

Sayedta Tahmina Quayyum

School of Business, United International University

UIU Bhaban, House – 80, Road – 8A

Dhanmondi, Dhaka – 1209, Bangladesh

Tel: 880-28-152-218 E-mail: stq9999@gmail.com

Received: July 17, 2011

Accepted: September 5, 2011

Published: January 1, 2012

doi:10.5539/ijbm.v7n1p58

URL: <http://dx.doi.org/10.5539/ijbm.v7n1p58>

Abstract

This study is an attempt to investigate if there is any relationship between working capital management and profitability of manufacturing corporations. For this purpose Corporations enlisted with the Dhaka Stock Exchange has been selected and the analysis covers a time period from year 2005 to 2009. The purpose of this paper is to figure out if there is statistically significant relationship between the profitability and working capital management and help explain the necessity of firms optimizing their level of working capital management efficiency and in that way management taking productive actions to maximize their profitability. The result of this study clearly shows that except for food industry all other selected industries have a significant level of relationship between the Profitability Indices and various Working Capital Components. This paper also shows that the significance level of relationship varies from industry to industry.

Keywords: Working capital management, Cement industry, Food industry, Pharmaceuticals industry, Engineering industry, Cash conversion cycle

1. Introduction

Working capital management is an area which is very widely revisited by academicians along with capital budgeting, Lazaridis and Tryfonidis (2006). This area of finance has been approached in various ways by many academicians in many countries over the world. But in a developing country as ours, this area has not been revisited very extensively. For this purpose, this study focuses on the relationship between working capital efficiency and the profitability of manufacturing firms in Bangladesh. The working capital is considered as the life blood of a firm (Scherr, 1989). And cash conversion cycle is the primary measure of working capital efficiency. Cash conversion cycle basically shows how long it takes a firm to convert resource inputs into cash flows. This consists of three parts, receivables collection period, payables deferral period and inventory turnover period. The theoretical importance of the working capital component over the profitability ratio is very clear, that is, the lesser the time a firm needs to realize cash from its customers relative to the time it requires to pay off its creditors, the better it is for its liquidity position and thus reduces the risk of dependency on external and more expensive sources of capital. So firms with lesser duration of cash conversion cycle are considered to be more efficient. There has been many studies done in this area across the world, some has focused mainly on optimizing accounts receivable management so that the firms can maximize profit, as we see in Besley, Scott and Meyer (1987), some has focused on the relationship between profitability and working capital efficiency, Lazaridis and Tryfonidis (2006), some has focused on the impact on cash due to management of working capital components as Cote and Latham (1999, p. 261), and some has focused on trade credit, Pike and Nam (2001). After all these, it is practically experienced by many analysts or even investors that their remains a disparity between literature and pragmatic world, especially when it comes to developing countries. This study is expected to provide the investors of Bangladesh with a view about the working capital performance of firms they invest with and relate the expected profitability from their investment. This study shows the extent of dependency of profitability ratios over the working capital components of firms if there happens to be any. And thus investigate the practical applicability of the theoretical implications on the manufacturing firms of

Bangladesh.

2. Literature Review

The attention of academicians and corporate managers over optimizing working capital components is not very new, rather, many have provided with a variety of thoughts for the welfare of businesses over many years. For over 25 years ago, Largay and Stickney (1980, p. 53) reported that the then-recent bankruptcy of W. T. Grant, a nationwide chain of department stores, should have been anticipated because the corporation had been running a deficit cash flow from operations for eight of the last ten years of its corporate life. This incident is an example that, a firm will have to suffer if it depends on external financing for too long and does not take steps to minimize their dependency on external sources of funds. Not only this, moving to more recent studies, we can say about the Greek researchers Lazaridis and Tryfonidis (2006), who had found a relationship between working capital management efficiency and profitability and so did Shin and Soenen (1998), Deloof (2003) and many others. According to Deloof (2003) the way that working capital is managed has a significant impact on profitability of Belgian firms. This result indicates that there is a certain level of working capital requirements which potentially maximizes returns.

It has been showed that by minimizing the amount of funds tied up in current assets; firms can reduce financing costs and/or increase the funds available for expansion. But most firms may not realize that instantly. According to Wilner (2000) most firms extensively use trade credit despite its apparent greater cost, and trade credit interest rates commonly exceed 18 percent and Deloof (2003) also found that according to National Bank statistics during 1997, Belgian companies had accounts payable of only 13% of the total asset and accounts receivable and Inventory of 17% and 10% of the total asset respectively. Even in the UK corporate sector more than 80% of daily business transactions are on credit terms as found by Summers and Wilson (2000).

Cote and Latham (1999, p. 261) argued that management of receivables, inventory and accounts payable have tremendous impact on cash flows, which in turn affect the profitability of firms. According to Long, Malitz and Ravid (1993) it is seen that liberal credit terms to the customers increase the sales level of the firm, though having a continuous troubleshooting with managing short term financing in the finance department. The decision lays with the firm which one to put more importance on.

Scherr (1989, p. 16) claimed that companies can strengthen strong cash flow levels, improve profitability, budgeting and forecasting process, predictability and manageability of results, heighten risk if they implement the best practices in working capital, and Siddiquee and Khan (2009), has observed that, firms which are better at managing working capital are found to be able to make counter cyclical moves to build competitive advantage. And they are also better at generating fund internally and also face lesser trouble while seeking external sources of financing. According to Raheman and Nasr (2007) Pakistani firms' performance showed a significant relationship with the working capital management. The influence of working capital efficiency also applies to e-business. And that is the reason Hoyer, Janner, Mayer, Raus and Schroth (2006) found that the CCC is useful for e-businesses as well and that it meshes well with the balanced scorecard approach to quality management currently in vogue

The historic results have proved the importance of working capital management for better profitability of the firm. This study also attempts to figure out if there is any relationship between profitability of the firm and its working capital management efficiency in a developing country like Bangladesh. And also the extent of influence of the working capital management on the profitability when there is any such relationship.

3. Research Methods

3.1 Data Collection

The data used in this study have been collected from secondary sources, that is, the company's audited annual reports. The samples have been drawn from the listed firms of Dhaka Stock Exchange (DSE). To collect the data; at first the industries were selected. The sample industries were drawn on the basis of judgmental sampling in order to ensure diversification in the nature of business. Initially 6 industries were selected from which 4 industries were finalized. The selected industries are cement industry, food Industry, pharmaceuticals Industry and engineering industry. The firms selected from each industry were also based on judgmental sampling method. While drawing samples it was emphasized that the samples cover all sizes of firms in terms of capital and sales. The justification of taking DSE listed companies is that companies Listed in the stock markets are likely to go through a formal regulated audit process and have an incentive to attract new investors and make an impression by presenting profits if those exist in order to make their shares more attractive. But firms not listed with the stock exchange have less of an incentive to present true operational results and hide true profit in order

to avoid corporate tax, as according to Lazaridis and Tryfonidis (2006). From the cement Industry 4 out of 5 companies has been taken and 8 companies have been taken from food, pharmaceuticals and engineering industry each. So the sample size of firms is 28 ($n = 28$) of the four industries. And the duration covered in this study is from year 2005 to year 2009.

3.2 Methodology and Variables

As a methodology to study the relationship between working capital management efficiency and profitability, regression analysis has been used. For the purpose of simplicity and identifying each variables influence separately, single regression has been chosen. The regression analysis considered Profitability ratios as dependent variable and various working capital ratios and liquidity ratios as independent variables.

Here, cash conversion cycle is used to measure the performance of working capital management the way we found in Lazaridis and Tryfonidis (2006), Raheman and Nasr (2007). In order to gauge profitability, return on asset (ROA) and net profit margin (NPM) have been taken. They are the measures of profitability irrespective of the percentage of leverage in the capital structure of the company. Besides ROA and NPM, all other variables are independent variables. We can see all the variables chosen and their methods used for calculation as given in the following table.

So the variables that have been used are:

No	Variables	Method used for Calculation
1	Return On Asset (ROA)	Net Profit / Total Asset
2	Net Profit Margin (NPM)	Net Profit / Sales
3	Receivables Collection Period (RCP)	$360 / (\text{Sales} / \text{Accounts Receivables})$
4	Inventory Turnover Period (ITP)	$360 / (\text{COGS} / \text{Inventory})$
5	Payable Deferral Period (PDP)	$360 / (\text{COGS} / \text{Accounts Payable})$
6	Cash Conversion Cycle (CCC)	$\text{RCP} + \text{ITP} - \text{PDP}$
7	Current Ratio (CR)	Current Assets/ Current liabilities
8	Quick Ratio (QR)	$(\text{Current Assets} - \text{Inventory}) / \text{Current Liabilities}$

These independent variables listed above are the very basic measures of working capital efficiency and liquidity of a firm. So this study basically covers the current assets and current liabilities in extension to other studies like Cote and Latham (1999).

All the variables in the table above are expressed as ratios or proportions except for cash conversion cycle and its components. These variables have a unit of days.

To analyze the nature and extent of the relationships, correlation and regression test has been conducted. The dependent variables have been regressed against each independent variable. And the results have been expressed in the form of regression equation as below.

$$\gamma_i = \alpha_i + \beta_i X_i + \varepsilon_i$$

Where,

γ_i = Dependent Variable of i industry.

X_i = Independent variable of i industry.

α_i = Intercept for X variable of i industry.

β_i = Coefficient for the independent variable X of i industries, denoting the nature of relationship with dependent variable γ_i

ε_i = The error term.

In this paper, the subscript 'i' would be the initial of the industry it represents. For instance, 'C' stands for cement industry, 'F' for food industry, 'P' for pharmaceuticals industry and 'E' for engineering industry.

The finding section of this study has been segmented in two parts, in the first part the results have been discussed according to different industry sectors dependency of profitability on their working capital performance. The second part gives an overall view of the findings across the industries. First, we shall focus on the findings of cement industry.

4. Findings and Recommendations

4.1 Findings according to different industry sectors

4.1.1 Cement Industry

Correlation is used to figure out the nature of relationship between variables. Table 1 of Appendix- A contains the correlation matrix for the variables of cement industry. We can see that the return on asset and net profit margin are both negatively correlated with the cash conversion cycle. These results are consistent with the view that the shorter the period between production and sale of products the larger is the firm's profitability, Lazaridis and Tryfonidis (2006). It is understandable that companies with cash in hand can purchase raw materials from suppliers with better prices and also may take benefit in many other bargaining as found by Lazaridis and Tryfonidis (2006). Maybe that is the reason of quick ratio and current ratio are both having positive correlation with return on asset and net profit margin and a negative correlation with cash conversion cycle. Again negative relationship between cash conversion cycle and return on asset or cash conversion cycle and net profit margin indicate that more profitable firms either delay their payment towards their suppliers-creditors or accelerate their receivables.

Insert Table 1 here

To have further investigation about the extent of the relation and reliability of the result, regression has been used. At first the dependent variable return on asset was regressed against its independent variables, it showed a statistically significant relationship with inventory turnover period, payable deferral period, cash conversion cycle, quick ratio and current ratio as we can see in Table 1-1 from Appendix- A. The regression equations for variables that do not show significant relationship with the dependent variables have been excluded in this section. The equations for statistically significant variables that resulted out of the test are as below,

$$ROA_c = 0.14879 - 0.0015 ITP_c$$

$$ROA_c = -0.02747 + 0.0011 PDP_c$$

$$ROA_c = 0.07051 - 0.0006 CCC_c$$

$$ROA_c = -0.02323 + 0.0690 CR_c$$

$$ROA_c = 0.03458 + 0.0425 QR_c$$

The subscript 'C' denotes 'Cement Industry' for the preceding equations as has been explained earlier. For the cement industry, inventory turnover period and cash conversion cycle have a negative relationship with return on asset. Other than these, the rest have a positive relationship. The finding in this matter is sensible and consistent with the findings of other studies across the world including Soenen (1998) and Deloof (2003).

But when the regression was done for net profit margin against the same independent variables, as we can see in appendix Table 1-2, only cash conversion cycle and inventory turnover period showed statistically significant negative relation and the equation resulted from the test was as follows.

$$NPM_c = 0.247012 - 0.0043 CCC_c$$

$$NPM_c = 0.14880 - 0.0014 ITP_c$$

4.1.2 Food Industry

In Table 2, correlation between variables of food industry shows return on asset has a negative relationship with cash conversion cycle, receivables collection period and inventory turnover period. Net profit margin also has a negative relationship with cash conversion cycle but the extent is very low. Net profit margin also has a very low positive relationship with return on asset.

Insert Table 2 here

While doing regression for return on asset against the independent variables only payables deferral period and cash conversion cycle showed a statistically significant relationship. The regression equations for these variables that were derived from the result in table 2-1 are as following

$$ROA_F = 0.0743 - 0.0001 CCC_F$$

$$ROA_F = 0.030 + 0.0007 PDP_F$$

The regression equations for net profit margin that were derived from result in table 2-2 are

$$NPM_F = 0.0385 - 0.0003 ITP_F$$

$$NPM_F = 0.0460 + 0.0001 CCC_F$$

$$NPM_F = 0.0286 + 0.1037 QR_F$$

Here the inventory turnover period shows a negative relationship with net profit margin. But the cash conversion cycle does not show a negative relationship. This might be due to the sample firms chosen from the industry being not enough representative or other factors having more influence on the profitability of the firms in this industry. A further study is required to focus on this issue.

4.1.3 Pharmaceuticals Industry

The correlations of variables for pharmaceuticals industry is showed in table 3. Here we again see a negative relation between return on asset and cash conversion cycle, and net profit margin and cash conversion cycle. But the extent of the negative correlation is higher for return on asset compared to net profit margin. Return on asset and net profit margin both share a positive relationship between them. Current ratio and quick ratio have a positive relationship with both the dependent variables too. But the extent of the correlation is not even moderate.

Insert Table 3 here

To understand the dependency of dependent variables on the independent variables regression was conducted. And the statistically significant equations derived from Table 3-1 for return on asset were as below,

$$ROA_p = 0.1248 - 0.00093 RCP_p$$

$$ROA_p = 0.1275 + 0.00176 PDP_p$$

$$ROA_p = 0.14901 - 0.00044 CCC_p$$

$$ROA_p = 0.0587 + 0.0881 QR_p$$

While focusing on the dependent variable net profit margin of pharmaceuticals industry we found net profit margin of this industry had statistically significant relationship with only cash conversion cycle and quick ratio.

The regression equations derived from Table 3-2 for net profit margin were as following,

$$NPM_p = 0.144354 - 0.0004 CCC_p$$

$$NPM_p = 0.04105 + 0.136619 QR_p$$

So we see that cash conversion cycle and quick ratio exert more influence on net profit margin when it comes to pharmaceuticals industry of DSE.

4.1.4 Engineering Industry

The correlation table of the engineering industry shows return on asset and net profit margin both has a positive relationship with payable deferral period, current ratio and quick ratio. And negative relationship with inventory turnover period, receivables collection period and cash conversion cycle. The correlation table 4 shows detailed relationship among variables below.

Insert Table 4 here

To understand the extent of dependency of the two profitability ratios on their independent variables, regression has been done and the statistically significant regression equations can be seen as following. The derived equations from Table 4-1 for return on asset are as following,

$$ROA_E = 0.05327 - 0.0003 RCP_E$$

$$ROA_E = 0.04863 - 0.0001 CCC_E$$

$$ROA_E = -0.4106 + 0.0350 CR_E$$

$$ROA_E = -0.03199 + 0.0473 QR_E$$

For this industry, receivables collection period and cash conversion cycle have significant negative effect on the return on asset. But current ratio and quick ratio both have positive effect on return on asset. The statistically significant regression equations for net profit margin are as below,

$$NPM_E = 0.1033 - 0.0008 RCP_E$$

$$NPM_E = 0.0814 - 0.0003 CCC_E$$

$$NPM_E = -0.1206 + 0.0686 CR_E$$

For net profit margin, quick ratio did not show statistically significant effect on net profit margin as we see in Table 4-2.

4.2 Summary of the results across all industry sectors

For an overall view of all the findings of this study, the results are expressed in tabular form in Table 5 and Table 6 for dependent variable return on asset and net profit margin respectively. The tables contain only the variables which have statistically significant relationship with the dependent variables. And the levels of significance are also expressed according to the note following the tables.

In Table 5 it can be seen that return on asset has a statistically significant negative relationship with cash conversion cycle for all four industry data. But the significance is highest with the pharmaceuticals industry and higher for engineering industry. Among the components of cash conversion cycle, payables deferral period has a positive influence on cement, food and pharmaceuticals industry. Receivables collection period has a statistically significant relationship when it comes to pharmaceuticals industry and engineering industry. Inventory turnover period has a statistically significant negative effect on cement industry only.

Insert Table 5 here

The result of the test for net profit margin varied a bit due to the extent and nature of relationship between return on asset and net profit margin. Cash conversion cycle showed statistically significant negative effect on net profit margin for all the industries except food industry. Inventory turnover period shows a negative effect on both cement industry and food industry. Only engineering industry have a statistically significant negative relationship with receivables collection period and a statistically significant positive relationship with current ratio. Quick ratio has a statistically significant relationship with food industry and pharmaceuticals industry only.

Insert Table 6 here

From the two preceding tables, it can be clearly deduced that the working capital management has a significant effect on the profitability of the firms in Bangladesh. Among all the components, cash conversion cycle is most significant for both the profitability measures. And its component payable deferral period is most statistically significant when return on the total capital is to be focused on. This also has a better explanatory power also. Firms should also keep track on their liquidity ratios as these also exert influence on the profitability of the firm. The firms should also be cautious when considering credit terms as receivables collection period also have significant effect on the profitability of two out of four industries. So, the managements of the firms have enough scope to enhance the profitability by emphasizing on the receivables and payables management.

This result is confirmed by the outcome found in Table 7, Appendix- B. The figure 1 is based on that outcome.

Insert Figure 1 here

In figure: 1 it can be well appreciated that the industry which has a higher cash conversion bars is facing a comparatively lower level of return on asset and net profit margin both. The result is prominent with engineering industry and pharmaceuticals industry.

From this study it is also understandable that there are other factors apart from working capital which exerts influence on the profitability of the firm. So firms should also be focusing on other areas of business along with working capital management.

5. Conclusion and Recommendations

As a conclusion to this study it can be said that the manufacturing firms of Bangladesh have enough scope to better their performance by efficiently managing their working capital. This finding is consistent with the findings of many researchers across the world along with Cote and Latham (1999, p. 261), Lazaridis and Tryfonidis (2006), Soenen (1998), Deloof (2003), Raheman and Nasr (2007) etc. The result clearly states that the shorter is the cash conversion cycle, the more profitable the firm is likely to be. The firms should also put much importance on their receivables management and payables management to derive the best out of their profitability. This finding is also consistent with Besley, Scott and Meyer (1987), Cote and Latham (1999, p. 261). According to this study, Bangladeshi firms should focus on working capital management along with other areas of the business with proper emphasis and thus boost up the profitability of the firm. The employees at the concerned field level should be aware of the necessity of the turnovers of receivables and payables as well. As it has been found that firms with higher profit margins have either shorter receivables collection time or longer accounts payable period, therefore the firms can create profit by handling the working capital with better efficiency and maintaining the cash conversion cycle components at optimum level.

6. Suggestions for Future Research

This study can be a base to extend the research for other industries of the market as well. While doing this study the necessity of observing the cash position was also realized. As holding enough cash has been explained as a

probable reason by Lazaridis and Tryfonidis (2006) for companies to enjoy better pricing with their suppliers and also a reason to affect the profitability of the firm. So this can be a scope for further research regarding the area of working capital in Bangladesh.

7. Limitations

This study was intended to be a preliminary prior to analyze all the manufacturing industries of the Dhaka Stock Exchange (DSE). So the initial sample industries chosen were 6. But due to unavailability and insufficiency of data, this study only considers four diverse industries. The independent variables included are only related to liquidity and working capital even though other factors are believed to be influential enough for the profitability of the firms. Future research is necessary to determine other potential influencing factors as independent variables.

References

- Besley, Scott & Meyer, R.L. (1987). *An Empirical Investigation of Factors Affecting the Cash Conversion Cycle*. Annual Meeting of the Financial Management Association, Las Vegas Nevada.
- Cote, J. M., & Latham, C. K. (1999). The Merchandising Ratio: A Comprehensive Measure of Working Capital Strategy. *Issues in Accounting Education*, 14(2), 255-267. <http://dx.doi.org/10.2308/iace.1999.14.2.255>
- Deloof, M. (2003). Does Working Capital Management Affect Profitability of Belgian Firms?. *Journal of Business Finance & Accounting*, 30 (3& 4), p. 585. <http://dx.doi.org/10.1111/1468-5957.00008>
- Hoyer, V., Janner, T., Mayer, P., Raus, M., & Schroth, C. (2006). Small and medium enterprise's benefits of next generation e-business platforms. *The Business Review*, Cambridge, 6 (1), 285-291.
- Largay, J., & Stickney, C. (1980). Cash Flows, Ratio Analysis and the W. T. Grant Company Bankruptcy. *Financial Analyst Journal*, pp. 51-54 12.
- Lazaridis, I., & Tryfonidis, D. (2005). The relationship between working capital management and profitability of listed companies in the Athens Stock Exchange. SSRN.com. [Online] Available: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=931591
- Long, M.S., Malitz, I.B., & Ravid, S.A. (1993). Trade Credit, Quality Guarantees, and Product Marketability. *Financial Management*, 22(4), 117-127. <http://dx.doi.org/10.2307/3665582>
- Pike R., & Nam, S. C. (2001). Credit Management: An Examination of Policy Choices, Practices and Late Payment in UK Companies. *Journal of Business Finance & Accounting*, 28(78), 1013. <http://dx.doi.org/10.1111/1468-5957.00403>
- Raheman, A., & Nasr, M. (2007). Working Capital Management And Profitability – Case Of Pakistani Firms. *International Review of Business Research papers*, 3(1), 279 – 300.
- Scherr, F. C. (1989). *Modern Working Capital Management, Text and Cases*. Englewood Cliffs, New Jersey: Prentice-Hall International Editions.
- Shin, H. H., & Soenen, L. (1998). Efficiency of Working Capital Management and Corporate Profitability, *Financial Practice and Education*, 8(2), 37-45.
- Siddiquee, M. M., & Khan, S. M. (2008). Analyzing Working Capital Performance: Evidence from Dhaka Stock Exchange (DSE) Ltd. *The Journal of Nepalese Business Studies*, III(1).
- Summers B., & Wilson, N. (2000). Trade Credit Management and the Decision to Use Factoring: An Empirical Study. *Journal of Business Finance & Accounting*, 27 (1&2), 37- 68. <http://dx.doi.org/10.1111/1468-5957.00305>
- Wilner, B. (2000). The exploitation of relationships in financial distress: The case of trade credit. *The Journal of Finance*, 55(1), 153. <http://dx.doi.org/10.1111/0022-1082.00203>

Table 1. Correlation between Profitability Ratios and Working Capital Ratios of Cement Industry

	ROA	NPM	RCP	ITP	PDP	CCC	QR	CR
ROA	1							
NPM	0.6543	1						
RCP	0.0228	0.4506	1					
ITP	-0.624	-0.379	0.3965	1				
PDP	0.7203	0.2615	-0.2811	-0.5188	1			
CCC	-0.725	-0.584	0.6123	0.7997	-0.8728	1		
QR	0.7548	0.1092	-0.38	-0.477	0.8658	-0.8066	1	
CR	0.5628	0.2959	0.3258	-0.1276	0.057	0.0152	0.244	1

Source: Authors own calculation from relevant source data.

Table 1-1. Regression Analysis for ROA of Cement Industry in DSE

Dependent Variable	Independent Variable	R Square	Coefficient	P Value	Standard Error of Estimate
ROA	ITP	0.3131	-0.0015	0.0468	0.04551
ROA	RCP	0.0019	0.0001	0.8887	0.05485
ROA	PDP	0.4434	0.0011	0.013	0.0409
ROA	CCC	0.3701	-0.0006	0.0301	0.04392
ROA	CR	0.4133	0.069	0.0197	0.0424
ROA	QR	0.5575	0.0425	0.0038	0.0369

Source: Authors own calculation from relevant source data.

Table 1-2. Regression Analysis for NPM of Cement Industry in DSE

Dependent Variable	Independent Variable	R Square	Coefficient	P Value	Standard Error of Estimate
NPM	ITP	0.1349	-0.0014	0.2362	0.0763
NPM	RCP	0.1887	0.0021	0.138	0.07343
NPM	PDP	0.0681	0.0006	0.3893	0.0787
NPM	CCC	0.899	-0.0043	0	0.23
NPM	CR	0.12	4.4384	0.27	6.55
NPM	QR	0.0067	0.007	0.7899	0.0811

Source: Authors own calculation from relevant source data.

Table 2. Pearson Correlation between Performance Indicators of Food Industry

	ROA	NPM	ITP	RCP	PDP	CCC	CR	QR
ROA	1							
NPM	0.0224	1						
ITP	-0.311	-0.375	1					
RCP	-0.26	0.305	0.669	1				
PDP	0.6838	-0.318	-0.5327	-0.247	1			
CCC	-0.412	-0.078	0.9858	0.6945	-0.6526	1		
CR	0.0085	0.4437	0.8791	0.8619	-0.2668	0.8555	1	
QR	0.1798	0.1016	0.6671	0.952	-0.1892	0.6769	0.8813	1

Source: Authors own calculation from relevant source data.

Table 2-1. Regression Analysis for ROA of Food Industry in DSE

Dependent Variable	Independent Variable	R Square	Coefficient	P Value	Standard Error of Estimate
ROA	ITP	0.1169	-0.0001	0.1949	0.0604
ROA	RCP	0.0950	-0.0006	0.2838	0.0512
ROA	PDP	0.5509	0.0007	0.0027	0.0365
ROA	CCC	0.2433	-0.0001	0.0802	0.0471
ROA	CR	0.0091	-0.0010	0.7254	0.0640
ROA	QR	0.0498	-0.0057	0.4062	0.0627

Source: Authors own calculation from relevant source data.

Table 2-2. Regression Analysis for NPM of Food Industry in DSE

Dependent Variable	Independent Variable	R Square	Coefficient	P Value	Standard Error of Estimate
NPM	ITP	0.2370	-0.0003	0.0775	0.0646
NPM	RCP	0.1019	0.0008	0.2659	0.0701
NPM	PDP	0.1143	-0.0004	0.2370	0.0696
NPM	CCC	0.3049	0.0001	0.0201	0.0593
NPM	CR	0.2029	0.0051	0.1061	0.0661
NPM	QR	0.5856	0.1037	0.0023	0.0497

Source: Authors own calculation from relevant source data.

Table 3. Pearson Correlation between Performance Indicators of Pharmaceuticals Industry

	ROA	NPM	ITP	RCP	PDP	CCC	CR	QR
ROA	1							
NPM	0.7457	1						
ITP	0.1674	0.0152	1					
RCP	-0.375	-0.026	0.0781	1				
PDP	0.4715	0.1088	-0.2336	0.2763	1			
CCC	-0.643	-0.424	0.0803	0.7292	-0.3054	1		
CR	0.0828	0.1503	0.2095	0.5233	-0.0964	0.5451	1	
QR	0.3679	0.4338	-0.1135	0.0466	-0.243	-0.0614	0.671	1

Source: Authors own calculation from relevant source data.

Table 3-1. Regression Analysis for ROA of Pharmaceuticals Industry in DSE

Dependent Variable	Independent Variable	R Square	Coefficient	P Value	Standard Error of Estimate
ROA	ITP	0.0280	0.0000	0.3854	0.0640
ROA	RCP	0.1393	-0.0009	0.0422	0.0595
ROA	PDP	0.2303	0.0017	0.0073	0.0563
ROA	CCC	0.4203	-0.0004	0.0002	0.0492
ROA	CR	0.0069	0.0152	0.6695	0.0647
ROA	QR	0.1307	0.0881	0.0600	0.0601

Source: Authors own calculation from relevant source data.

Table 3-2. Regression Analysis for NPM of Pharmaceuticals Industry in DSE

Dependent Variable	Independent Variable	R Square	Coefficient	P Value	Standard Error of Estimate
NPM	ITP	0.0002	0.0000	0.9374	0.0829
NPM	RCP	0.0007	0.0001	0.8918	0.0814
NPM	PDP	0.0118	0.0005	0.5744	0.0810
NPM	CCC	0.1801	-0.0004	0.0195	0.0737
NPM	CR	0.0226	0.0351	0.4363	0.0819
NPM	QR	0.1809	0.1366	0.0193	0.0737

Source: Authors own calculation from relevant source data.

Table 4. Pearson Correlation between Performance Indicators of Engineering Industry

	ROA	NPM	ITP	RCP	PDP	CCC	CR	QR
ROA	1							
NPM	0.7212	1						
ITP	-0.325	-0.176	1					
RCP	-0.454	-0.523	0.8149	1				
PDP	0.2697	0.2753	0.4291	0.4377	1			
CCC	-0.569	-0.493	0.883	0.8244	0.0209	1		
CR	0.4233	0.3172	-0.3007	-0.5557	-0.3339	-0.3025	1	
QR	0.4226	0.3039	-0.2845	-0.4821	-0.2887	-0.2802	0.9747	1

Source: Authors own calculation from relevant source data.

Table 4-1. Regression Analysis for ROA of Engineering Industry in DSE

Dependent Variable	Independent Variable	R Square	Coefficient	P Value	Standard Error of Estimate
ROA	ITP	0.0076	0.0000	0.6479	0.0593
ROA	RCP	0.1701	-0.0003	0.0242	0.0542
ROA	PDP	0.0894	0.0001	0.1466	0.0611
ROA	CCC	0.2097	-0.0001	0.0149	0.0534
ROA	CR	0.1792	0.0350	0.0278	0.0595
ROA	QR	0.1812	0.0473	0.0281	0.0595

Source: Authors own calculation from relevant source data.

Table 4-2. Regression Analysis for NPM of Engineering Industry in DSE

Dependent Variable	Independent Variable	R Square	Coefficient	P Value	Standard Error of Estimate
NPM	ITP	0.0311	-0.0002	0.3787	0.1689
NPM	RCP	0.2830	-0.0008	0.0052	0.1463
NPM	PDP	0.0777	0.0004	0.1773	0.1650
NPM	CCC	0.2430	-0.0003	0.0090	0.1493
NPM	CR	0.1006	0.0686	0.0970	0.1628
NPM	QR	0.0924	0.0889	0.1233	0.1635

Source: Authors own calculation from relevant source data.

Table 5. T- Test Result for Dependent Variable ROA

Industry		ITP	RCP	PDP	CCC	QR	CR
Cement	Coefficient	-0.15%		0.11%	-0.06%	4.25%	6.90%
	Explanatory Power	31.31%		44.34%	37.00%	55.00%	41.01%
	Significance Level	*		*	*	**	*
Food	Coefficient			0.07%	-0.01%		
	Explanatory Power			55.00%	24.00%		
	Significance Level			**	#		
Pharmaceuticals	Coefficient		-0.09%	0.18%	-0.04%	8.81%	
	Explanatory Power		14.00%	23.03%	42.03%	13.00%	
	Significance Level		*	**	***	*	
Engineering	Coefficient		-0.26%		-0.14%	4.73%	3.50%
	Explanatory Power		17.01%		21.00%	18.00%	18.12%
	Significance Level		*		**	*	*
Note : *** = p < 0.001, ** = p < 0.01, * = p < 0.05, # = p < 0.10							

Source: Authors own calculation from relevant source data.

Table 6. T- Test Result for Dependent Variable NPM

Industry		ITP	RCP	PDP	CCC	QR	CR
Cement	Coefficient	-0.14%			-0.43%		
	Explanatory Power	13.49%			89.99%		
	Significance Level	*			***		
Food	Coefficient	-0.03%			0.01%	10.37%	
	Explanatory Power	24.00%			30.49%	59.00%	
	Significance Level	*			*	**	
Pharmaceuticals	Coefficient				-0.04%	13.66%	
	Explanatory Power				18.01%	18.09%	
	Significance Level				*	*	
Engineering	Coefficient		-0.08%		-0.03%		6.86%
	Explanatory Power		28.30%		24.30%		10.06%
	Significance Level		**		**		#
Note : *** = p < 0.001, ** = p < 0.01, * = p < 0.05, # = p < 0.10							

Source: Authors own calculation from relevant source data.

Table 7. Descriptive Statistics

	Cement Industry			Food Industry		
Variable	Mean	Median	Standard Error	Mean	Median	Standard Error
ROA	0.056	0.0442	0.0121	0.044	0.0395	0.0114
NPM	0.055	0.0433	0.0113	0.0490	0.0370	0.0147
ITP	57.5862	32.3089	14.7204	152.5757	33.1258	43.0891
RCP	126.2452	36.1313	89.7516	27.7259	19.0378	7.5949
PDP	842.6644	70.8139	777.9753	43.9865	7.2508	15.4756
CCC	92.4676	112.7977	16.1839	132.2451	31.9118	55.297
CR	1.0081	1.0727	0.1042	3.4920	1.3350	1.6633
QR	0.3344	0.4794	0.2364	1.4646	0.4017	0.4996
	Pharmaceuticals Industry			Engineering Industry		
Variable	Mean	Median	Standard Error	Mean	Median	Standard Error
ROA	0.0961	0.1127	0.0118	0.0126	0.0267	0.0124
NPM	0.1006	0.1256	0.0151	0.0355	0.0332	0.0324
ITP	289.868	96.3156	101.3525	250.9731	174.8806	35.8438
RCP	29.5957	27.6627	4.7986	150.7279	134.9785	21.473
PDP	17.6602	9.5540	3.2156	105.1962	44.7826	23.7629
CCC	118.969	110.6529	17.5454	296.5049	225.5024	48.8584
CR	1.342	1.3973	0.0647	1.5328	1.2308	0.1498
QR	0.4456	0.3686	0.0466	0.9423	0.7803	0.1107

Source: Authors own calculation from relevant source data.

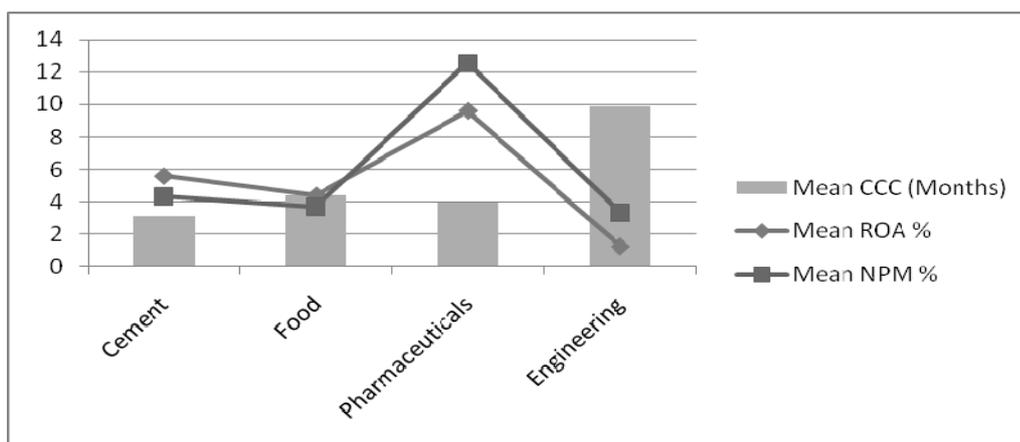


Figure 1. Comparative mean values of ROA, NPM and CCC across industries

Source: Authors own calculation from relevant source data.