IMPACT OF WORKING CAPITAL ON CORPORATE PERFORMANCE
A CASE STUDY FROM CEMENT, CHEMICAL AND ENGINEERING SECTORS OF PAKISTAN

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ABSTRACT
The purpose of this paper is to investigate the impact of working capital on the corporate performance in the cement, chemical and engineering sectors of Pakistan. The data is obtained from the annual reports issued by the companies during 2007-2011. To verify the relationship between the measures of working capital and profitability regression models are used. The results show that average collection period and operating cycle are positively whereas average age of inventory is negatively related to the return on equity. Firm size is positively whereas leverage is negatively related to the return on equity. Average payment period is negatively whereas cash conversion cycle is positively and significantly related with return on equity. The results indicate that working capital management influences the firms’ profitability.

Keywords: working capital, corporate performance, Profitability

1.0 INTRODUCTION:
Working capital management has become one of the essential issues in firms where the executives are trying to identify the working capital drivers and the appropriate level of working capital. (Wachowicz, 2004) A firm may adopt an aggressive working capital management policy with low level of current assets as compared to total assets, or it may have high level of current liabilities as compared to total liabilities. Too much current assets as a percentage of total assets may negatively affect the profitability of the firm whereas a low level of current assets may lead to a lower level of liquidity and stock outs, resulting in challenges in operations of the firm (Belt, 1979). So it has become very important for organizations to study working capital and its management.
Efficiency in working capital management is very important for all firms, especially production-oriented firms, due to the fact that their assets are mostly composed of current assets. This decision directly affects the liquidity and profitability of any firm (Raheman & Nasr, 2007). According to literature, bankruptcy of firms is caused by inappropriate practice of working capital management procedures, despite of positive returns or profitability due to such practice. So it would be risky to just focus on profitability while ignoring working capital management, also to focus just on liquidity while ignoring profitability. So what firms have got to do is to achieve a balance between profitability and liquidity.

Past studies focused mainly on the developed economies and there is less work done on management of working capital in less developed countries like Pakistan. In less developed countries, most of the firms are unfamiliar with the importance of working capital management and thus don’t bother to pay much attention on the management of working capital and its consequences. So it’s important to study working capital management and its impacts on profitability in these economies. This study looks at the issue from less developed economy by focusing specifically on firms listed in Karachi Stock Exchange in Pakistan. Latest data have been used to analyze the factors that affect the profitability of non-financial listed firms in Pakistan. This study would be helpful for future researches on profitability and working capital decisions of the companies.

2.0 LITERATURE REVIEW:
2.1 Working Capital (WC) – An Overview:
Working capital is an essential part of any business which shows the liquidity of that business. It is also known as working capital ratio. The level of working capital shows the extent up to which the business is able to encounter its day to day expenses (cash, marketable securities, debtors, inventories etc.). It is considered as a part of operating capital. It can be calculated by subtracting current assets from current liabilities:

\[
\text{WORKING CAPITAL} = \text{CURRENT ASSETS} - \text{CURRENT LIABILITIES}
\]

Current assets consist of accounts receivables and inventory while current liabilities consists of accounts payable. If current assets are greater than current liabilities then it shows that working capital is positive. Positive working capital shows that the company is able to pay its short term liabilities with current assets. However negative working capital shows that the company is not capable to meet its short term liabilities with its current assets (Wachowicz, 2004)

Positive working capital is required to make sure that a firm is able to continue its operations and that it has enough cash to satisfy both maturing short term debt and future operational expenses. An increase in working capital shows that the business has either increased its current assets (receivables and inventories) or has decreased its current liabilities (paid some short term credit). The current portion of obligation or liability that is payable within a period of one year is critical as it signifies a short term claim to current assets also often secured by long term assets.

2.2 Working Capital Management (WCM):
Working capital management deals with decisions relating to working capital and short term financing. It involves managing relationship between short term assets and short term liabilities of a firm. The purpose of working capital management is to ensure smooth continuity of operations of the firm and adequate availability of cash flow to satisfy maturing short term debt and forthcoming operational expenses. According to Gitman (2005) it includes the following:
2.2.1 Management of Cash:
It includes the realization of cash balance which is enough to meet the daily expenses of that business and which also reduces the holding cost of cash.

2.2.2 Management of Inventory:
It includes the identification of correct level of inventory for running production function smoothly and decisions related to functions like avoiding excess expense of raw material, decreasing the re-ordering cost, reducing lead time of production, reducing work in process and avoiding over production.

2.2.3 Debtors Management:
To design and establish such credit policies which attract the customers and improves the cash flows and return on capital for the organization.

2.2.4 Short Term Financing:
It includes decisions related to finding the suitable source of financing and decisions regarding financing, for example, to either obtain it from bank or from suppliers.

2.3 Factors that Affect Profitability:
Following are some factors that affect the profitability of firms:

2.3.1 Average Collection Period:
It measures the average number of days that accounts receivables are outstanding. The number of days between sending invoices to customers and collecting payments is calculated in average collection period. This ratio is calculated by dividing average accounts receivables with average daily sales in that period. According to theory of corporate finance, average collection period is having a negative relation with the profitability of a firm.

2.3.2 Average Age of Inventory:
It calculates how quickly the inventory is converted into sales. It’s an excellent measure of the efficiency of the company in managing the inventory. The important decision regarding inventory is that how much amount of cash should be tied up in inventory while meeting the other operations and functions of the business and demands of customers.

2.3.3 Average Payment Period:
It is the average time period for which the payables are outstanding. Also we can say that it is the approximate amount of time that a business takes to pay payments to its customers and clients. The longer the period the more advantageous for the firm so that funds can be put to other uses (Mathuva, 2010), (Morwakage, 2010), (Akinlo, 2011), (Raheman & Afza., 2010).

2.3.4 Operating Cycle:
It is the average time period between buying inventory and receiving cash proceeds from sales. It can be calculated by adding the number of days in sales of inventory and average collection period. It is expected to have a negative relationship with profitability i.e shorter the operating cycle, greater will be the profitability (Vural, Sokmen & Cetenak, 2012),(Gill, 2011) some of the studies have also shown positive relationship of operating cycle with profitability (Akinlo, 2011),(Sharma& Kumar, 2011).

2.3.5 Cash Conversion Cycle:
It states the length of time that a company takes to convert resource inputs into cash flows. It measures the time cash input is tied up in the production and sales process before it is converted through sales into cash. It considers the amount of time to sell the inventory, collect the receivables and to pay bills. It is calculated by summing up average age of inventory and average collection period and subtracting the sum with average payment period.
2.3.6 Leverage:
It shows the proportion of the total assets financed by all creditors and debtors. It shows the percentage of company’s assets that are provided through debt. The higher the ratio, greater will be the risk associated with firm’s operations and lesser will be the profitability (Bagchi, Chakrabarti & Roy, 2012), (Alipour, 2011), (Vural, Sokmen & Cetenak, 2012), (Napompech, 2012), (Gill, 2011), (Sharma & Kumar, 2011), (Raheman & Nasr, 2007), (Sunday E. Ogundipe, 2012), (Mathuva, 2010), (Akinlo, 2011), (Raheman & Afza, 2010). However a positive relationship of profitability with leverage is found by Abuzayed (2012).

2.3.7 Size:
It is determined by taking logarithm of assets or logarithm of sales. It is usually having a positive relationship with profitability i-e greater the firm size, higher will be the profitability of the firm (Napompech, 2012), (Alipour, 2011), (Vural, Sokmen & Cetenak 2012), (Gill, Biger & Mathur, 2010), (Deloof, 2003), (Raheman & Nasr, 2007), (Mathuva, 2010), (Padachi, 2006), (Raheman & Afza, 2010).

The purpose of this study is to find the relationship between the working capital management and corporate performance, up to what extent does the working capital positively influence or enhance the performance of the corporation, which of the components affects corporate performance positively and which of them affect negatively. For this purpose literature is viewed to check the work that has been previously done regarding the relationship between corporate profitability or any of its components which is given as follows.

Deloof (2003) examined the correlation of Working Capital Management and the performance of Belgian companies. A sample of 1009 non-financial Belgian companies for the period from 1992 to 1996 was used. Results showed a significantly negative relationship between Gross Profits and the Average Period of Receivables, the Average Period of Inventories, and Average Period of Payables. Greater the periods of receivables, inventories and payables, lesser will be the Profitability of the firm. To empirically investigate the relationship between liquidity and profitability, a sample of 29 joint stock companies for five year (1996-2000) was taken by Eljelly (2004) and correlation and regression analysis was used for estimation. The results revealed that a negative significant relationship exists between profitability and liquidity. Also profitability is mostly influenced by current ratio that is an important liquidity measure. Sharma & Kumar (2011) took a sample data of 263 non-financial BSE 500 firms listed on Bombay stock exchange from year 2000-2008 and used OLS multiple regression model as analysis technique. The results show positive and significant relationship of profitability and working capital management.

The above studies clearly elaborate the importance of Working Capital Management and its components on the profitability and performance of any business entity or corporation. Its importance is unquestionable either the business is on a small or large scale. But in Pakistan there is little work regarding the importance of working capital on different sectors. So this research is an effort to fill this gap and observe the impact of working capital on specific sectors. Development of Hypothesis

On the basis of above literature review, these hypotheses may be developed:

**H1:** There is positive and significant relationship between average collection period and ROE.

**H2:** There is positive and significant relationship between average age of inventory and ROE.

**H3:** There is positive and significant relationship between average payment period and ROE.

**H4:** There is positive and significant relationship between operating cycle and ROE.

**H5:** There is positive and significant relationship between cash conversion cycle and ROE.
Model:
This study employed panel data procedures because sample contained data across firms and
time. The model used here was used before by Abuzayed (2012). The use of panel data
increases the sample size considerably and is more appropriate to study the dynamics of change.
A panel econometric technique namely pooled ordinary least square (OLS) is used to investigate
the most significant factors that can affect the dividend choice. Accordingly, the basic regression
is expressed as
\[ y_{it} = \alpha + X_{it}\beta + \mu_{it} \]
i = 1, ...................., 38; \ t = 1, ........., 5
Where \( i \) stands for the \( i \)th cross-sectional unit and \( t \) for the \( t \)th time period. \( y_{it} \) is performance
measure (\( ROE_{it} \)) for the \( i \)th firm at time \( t \), and \( \alpha \) is the intercept. \( X_{it} \) is a \( 1 \times K \) vector of
observations on \( K \) explanatory variables for the \( i \)th firm in the \( t \)th period, \( \beta \) is a \( K \times 1 \) vector of
parameters, \( \mu_{it} \) is a disturbance term and is defined as
\[ \mu_{it} = \mu_i + \nu_{it} \]
Where \( \mu_i \) denotes the unobservable individual effects and \( \nu_{it} \) denotes the remainder disturbance.
The descriptions of three estimation models (i.e., pooled OLS, fixed effects and random effects)
can be written for each component of working capital as below.
\[
ROE_{it} = \beta_0 + \beta_1 ACP_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \varepsilon_{it} \\
ROE_{it} = \beta_0 + \beta_1 AAI_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \varepsilon_{it} \\
ROE_{it} = \beta_0 + \beta_1 APP_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \varepsilon_{it} \\
ROE_{it} = \beta_0 + \beta_1 OC_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \varepsilon_{it} \\
ROE_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 LEV_{it} + \beta_3 SIZE_{it} + \varepsilon_{it} \\
\]
Where \( ROE_{it} \) is the return on equity for the \( i \)th firm at the time \( t \), \( ACP_{it} \) is the average collection
period of \( i \)th firm at time \( t \), \( AAI_{it} \) is the average age of inventory of the \( i \)th firm at time \( t \), \( APP_{it} \) is
the average payment period of the \( i \)th firm at time \( t \), \( OC_{it} \) is the operating cycle of the \( i \)th firm at
the time \( t \), \( CCC_{it} \) is the cash conversion cycle of \( i \)th firm at time \( t \), \( LEV_{it} \) is the leverage of the \( i \)th
firm at time \( t \), \( SIZE_{it} \) is the size of the \( i \)th firm at time \( t \), \( \beta_0 \) is the intercept, \( \varepsilon_{it} \) is the random error
term for the \( i \)th firm at time \( t \). \( \beta_1 - \beta_3 \) are the coefficients of the concerned variables.

3. METHODOLOGY:
The population for this study is companies from cement, chemical and engineering sectors of
Pakistan. The sample size is the data of 38 non-financial firms listed on Karachi stock exchange
of Pakistan. The study is conducted on the basis of secondary data. For the purpose of data
collection annual reports are used. Return on assets and return on equity are the dependent
variables that are measures of profitability. Alternatively, explanatory variables include average
age of inventory, average collection period, average payment period, operating cycle and cash
conversion cycle. Leverage and firm size as logarithm of assets are the controlled variables. The
study is quantitative in nature as the results and final findings are based on data collection from
annual reports. And these results are quantified using different statistical tools. This study is
related to panel data in nature. Data from annual reports is collected and is used to generate
information with the help of statistical tools and the analysis is done.

4. RESULT AND DISCUSSION:
Table 1 presents the descriptive statistics for all the regression variables computed from financial
statements, the average (median) return on equity (measured as profit before taxation/ total
shareholder equity) is 0.1628 (0. 1466). Also the average (median) of average collection period
calculated as trade debts/ (sales/360) is 18.3714 (10.0948). The average (median) of average age of inventory (measured as 360/ inventory turnover) is 64.4548 (48.3341) and the average (median) of average payment period [measured as trade debts/ (purchases/360)] is 208.9368 (138.2180). The average (median) of cash conversion cycle (measured as [average age of inventory + average collection period]-average payment period) is -126.1123 (-31.4368) and the average (median) of operating cycle (measured as average age of inventory + average collection period) is 82.8262 (65.1457). The average (median) firm size (measured as using logarithm of assets) is 15.4416 (15.7575) and the average (median) leverage (measured as total liabilities/ total assets) is 0.4980 (0.5337).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROE_{it}</td>
<td>185</td>
<td>0.1628</td>
<td>0.2748</td>
<td>0.1466</td>
<td>1.3785</td>
<td>-0.6215</td>
</tr>
<tr>
<td>ACP_{it}</td>
<td>185</td>
<td>18.3714</td>
<td>19.1943</td>
<td>10.0948</td>
<td>86.4021</td>
<td>0.0000</td>
</tr>
<tr>
<td>AAI_{it}</td>
<td>185</td>
<td>64.4548</td>
<td>56.5030</td>
<td>48.3341</td>
<td>372.0734</td>
<td>0.1159</td>
</tr>
<tr>
<td>APP_{it}</td>
<td>185</td>
<td>208.9386</td>
<td>200.1708</td>
<td>138.2180</td>
<td>1000.731</td>
<td>0.1115</td>
</tr>
<tr>
<td>OC_{it}</td>
<td>185</td>
<td>82.8262</td>
<td>61.8131</td>
<td>65.1457</td>
<td>372.0734</td>
<td>0.1284</td>
</tr>
<tr>
<td>CCC_{it}</td>
<td>185</td>
<td>-126.1123</td>
<td>227.9269</td>
<td>-31.4368</td>
<td>283.0389</td>
<td>-936.8243</td>
</tr>
<tr>
<td>SIZE_{it}</td>
<td>185</td>
<td>15.4416</td>
<td>1.6521</td>
<td>15.7575</td>
<td>18.3629</td>
<td>9.8135</td>
</tr>
<tr>
<td>LEV_{it}</td>
<td>185</td>
<td>0.498</td>
<td>0.1858</td>
<td>0.5337</td>
<td>0.9317</td>
<td>0.0058</td>
</tr>
</tbody>
</table>

4.1 Correlation of Variables:

We test for possible degree of multi co linearity among the explanatory variables in table. 2 According to the findings of table. 2 return on equity is positively correlated with average collection period, firm size and cash conversion cycle while negatively correlated with average age of inventory, average payment period and leverage. Similarly average collection period is having positive correlation with return on equity, average age of inventory, leverage cash conversion cycle and operating cycle and negative correlation with average payment period and firm size. Average age of inventory is having positive correlation with average collection period, cash conversion cycle and operating cycle and has negative correlation with return on equity, average payment period, firm size and leverage. Similarly return on equity, average collection period, average age of inventory, cash conversion cycle and operating cycle are having negative correlation with average payment period while leverage and growth are having positive correlation with average payment period. Firm size (natural logarithm of asset) is having positive correlation with return on equity, average payment period and leverage and negative correlation with average collection period, average age of inventory, cash conversion cycle and operating cycle. Return on equity, average age of inventory, cash conversion cycle and operating cycle are negatively correlated with leverage while average collection period, average payment period and firm size are positively correlated with leverage. Cash conversion cycle is positively correlated with return on equity, average collection period, average age of inventory and operating cycle while negatively correlated with average payment period, firm size and leverage. Similarly return
on equity, average payment period, firm size and leverage are negatively correlated with operating cycle while average collection period, average age of inventory and cash conversion cycle are positively correlated with operating cycle.

Table 2: Correlation matrix

<table>
<thead>
<tr>
<th>Variables</th>
<th>$ROE_{it}$</th>
<th>$ACP_{it}$</th>
<th>$AAI_{it}$</th>
<th>$APP_{it}$</th>
<th>$SIZE_{it}$</th>
<th>$LEV_{it}$</th>
<th>$CCC_{it}$</th>
<th>$OC_{it}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ROE_{it}$</td>
<td>1.0000</td>
<td>0.0078</td>
<td>-0.0156</td>
<td>-0.2027</td>
<td>0.0880</td>
<td>-0.1335</td>
<td>0.1747</td>
<td>-0.0119</td>
</tr>
<tr>
<td>$ACP_{it}$</td>
<td>0.0078</td>
<td>1.0000</td>
<td>0.1197</td>
<td>-0.1929</td>
<td>-0.4548</td>
<td>0.1082</td>
<td>0.2833</td>
<td>0.4200</td>
</tr>
<tr>
<td>$AAI_{it}$</td>
<td>-0.0156</td>
<td>0.1197</td>
<td>1.0000</td>
<td>-0.2908</td>
<td>-0.2230</td>
<td>-0.1022</td>
<td>0.5134</td>
<td>0.9512</td>
</tr>
<tr>
<td>$APP_{it}$</td>
<td>-0.2027</td>
<td>-0.1929</td>
<td>-0.2908</td>
<td>1.0000</td>
<td>0.3764</td>
<td>0.2529</td>
<td>-0.9665</td>
<td>-0.3257</td>
</tr>
<tr>
<td>$SIZE_{it}$</td>
<td>0.0880</td>
<td>-0.4548</td>
<td>-0.2230</td>
<td>0.3764</td>
<td>1.0000</td>
<td>0.0334</td>
<td>-0.4242</td>
<td>-0.3450</td>
</tr>
<tr>
<td>$LEV_{it}$</td>
<td>-0.1335</td>
<td>0.1082</td>
<td>-0.1022</td>
<td>0.2529</td>
<td>0.0334</td>
<td>1.0000</td>
<td>-0.2383</td>
<td>-0.0598</td>
</tr>
<tr>
<td>$CCC_{it}$</td>
<td>0.1747</td>
<td>0.2833</td>
<td>0.5134</td>
<td>-0.9665</td>
<td>-0.4242</td>
<td>1.0000</td>
<td>-0.5572</td>
<td></td>
</tr>
<tr>
<td>$OC_{it}$</td>
<td>-0.0119</td>
<td>0.4200</td>
<td>0.9512</td>
<td>-0.3257</td>
<td>-0.3450</td>
<td>-0.0598</td>
<td>0.5572</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

4.2 Findings:
Pooled OLS estimation method is used here for analysis of the impact of explanatory variables. The results are discussed as follows:

4.2.1 Effect of Average Collection Period on Profitability (ROE):
According to the results indicated in table 3 below, average collection period ($p=0.3167$) is not significant but having a positive relationship with profitability (return on equity). This positive relationship indicates that as the average collection period increases, the profitability of the firm also increases.

Table 3: Effect of average collection period on profitability (ROE)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistics</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C$</td>
<td>-0.0870</td>
<td>0.2247</td>
<td>-0.3870</td>
<td>0.6992</td>
</tr>
<tr>
<td>$ACP_{it}$</td>
<td>0.0011</td>
<td>0.0011</td>
<td>1.0041</td>
<td>0.3167</td>
</tr>
<tr>
<td>$SIZE_{it}$</td>
<td>0.0217</td>
<td>0.0137</td>
<td>1.5860</td>
<td>0.1145</td>
</tr>
<tr>
<td>$LEV_{it}$</td>
<td>-0.2172</td>
<td>0.1092</td>
<td>-1.9879</td>
<td>0.0483</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.0317</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adjusted $R^2$ = 0.1628
S.E regression = 0.2748
$F$-statistics = 0.1184

4.2.2 Effect of Average Age of Inventory on Profitability (ROE):
The results shown in table 4 below indicate that average age of inventory ($p=0.8995$) is not significant and is having a negative relationship with profitability (ROE). This shows that decreasing average age of inventory will increase profitability (ROE) while increasing average age of inventory will negatively affect profitability (ROE).

Table 4: Effect of average age of inventory on profitability (ROE)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistics</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C$</td>
<td>0.0345</td>
<td>0.2081</td>
<td>0.1660</td>
<td>0.8683</td>
</tr>
<tr>
<td>$AAI_{it}$</td>
<td>-4.65E-05</td>
<td>0.0003</td>
<td>-0.1265</td>
<td>0.8995</td>
</tr>
<tr>
<td>$SIZE_{it}$</td>
<td>0.01505</td>
<td>0.0125</td>
<td>1.2029</td>
<td>0.2306</td>
</tr>
<tr>
<td>$LEV_{it}$</td>
<td>-0.2033</td>
<td>0.1090</td>
<td>-1.8651</td>
<td>0.0638</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.0264</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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4.2.3 Effect of Average Payment Period on Profitability (ROE):
According to the pooled OLS estimation method, the results of table 5 given below show a significant but negative relationship of average payment period (p=0.0017) with profitability (ROE). This shows that lengthening the average payment period may negatively impact profitability (ROE) while by shortening average payment period, the profitability (ROE) will increase.

Table 5  Effect of average payment period on profitability (ROE)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std.Error</th>
<th>t-Statistics</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.1867</td>
<td>0.2015</td>
<td>-0.9265</td>
<td>0.3554</td>
</tr>
<tr>
<td>APP_{it}</td>
<td>-0.0003</td>
<td>0.0001</td>
<td>-3.1791</td>
<td>0.0017</td>
</tr>
<tr>
<td>SIZE_{it}</td>
<td>0.0309</td>
<td>0.0128</td>
<td>2.4091</td>
<td>0.0170</td>
</tr>
<tr>
<td>LEV_{it}</td>
<td>-0.1117</td>
<td>0.1093</td>
<td>-1.0218</td>
<td>0.3082</td>
</tr>
<tr>
<td>R^2</td>
<td>0.0778</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R^2</td>
<td>0.0626</td>
<td>Mean dependent var.</td>
<td>0.1628</td>
<td></td>
</tr>
<tr>
<td>S.E regression</td>
<td>0.2661</td>
<td>S.D. dependent var.</td>
<td>0.2748</td>
<td></td>
</tr>
<tr>
<td>F-statistics</td>
<td>5.0959</td>
<td>Probability (F-statistic)</td>
<td>0.0020</td>
<td></td>
</tr>
</tbody>
</table>

4.2.4 Effect of Operating Cycle and Profitability (ROE):
In table 6 below, the results of pooled OLS estimation suggest that operating cycle (p=0.8629) has positively insignificant relationship with profitability (ROE). This result shows that by stretching operating cycle, the profitability will increase while by shortening operating cycle, profitability will be affected negatively.

Table 6  Effect of operating cycle and profitability (ROE)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistics</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.0080</td>
<td>0.2197</td>
<td>0.0368</td>
<td>0.9707</td>
</tr>
<tr>
<td>OC_{it}</td>
<td>6.02E-05</td>
<td>0.0003</td>
<td>2.1729</td>
<td>0.8629</td>
</tr>
<tr>
<td>SIZE_{it}</td>
<td>0.0161</td>
<td>0.0130</td>
<td>1.2446</td>
<td>0.2149</td>
</tr>
<tr>
<td>LEV_{it}</td>
<td>-0.2010</td>
<td>0.1086</td>
<td>-1.8503</td>
<td>0.0659</td>
</tr>
<tr>
<td>R^2</td>
<td>0.0265</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R^2</td>
<td>0.0104</td>
<td>Mean dependent var.</td>
<td>0.1628</td>
<td></td>
</tr>
<tr>
<td>S.E regression</td>
<td>0.2734</td>
<td>S.D. dependent var.</td>
<td>0.2748</td>
<td></td>
</tr>
<tr>
<td>F-statistics</td>
<td>1.6457</td>
<td>Probability (F-statistic)</td>
<td>0.18044</td>
<td></td>
</tr>
</tbody>
</table>

4.2.5 Effect of Cash Conversion Cycle on Profitability (ROE):
The combined effect of all the three variables is analyzed by estimating the relationship of profitability and cash conversion cycle in table 7 below. Pooled OLS estimation shows that cash conversion cycle (p=0.0044) is having a significant and positive relationship with profitability.
(ROE). The relationship is consistent with the view that increase in cash conversion cycle positively impacts the profitability while a decrease in cash conversion cycle will negatively affect profitability.

Table 7: Effect of Cash Conversion Cycle on Profitability (ROE)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistics</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-0.2300</td>
<td>0.2106</td>
<td>-1.0924</td>
<td>0.2761</td>
</tr>
<tr>
<td>$CCC_{it}$</td>
<td>0.0002</td>
<td>9.86E-05</td>
<td>2.8850</td>
<td>0.0044</td>
</tr>
<tr>
<td>$SIZE_{it}$</td>
<td>0.0317</td>
<td>0.0132</td>
<td>2.4032</td>
<td>0.0173</td>
</tr>
<tr>
<td>$LEV_{it}$</td>
<td>-0.1237</td>
<td>0.1095</td>
<td>-1.1298</td>
<td>0.2600</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.0691</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.0537</td>
<td>Mean dependent var.</td>
<td>0.1628</td>
<td></td>
</tr>
<tr>
<td>S.E regression</td>
<td>0.2673</td>
<td>S.D. dependent var.</td>
<td>0.2748</td>
<td></td>
</tr>
<tr>
<td>$F$-statistics</td>
<td>4.4852</td>
<td>Probability ($F$-statistic)</td>
<td>0.0046</td>
<td></td>
</tr>
</tbody>
</table>

4.2.6 Effect of Control Variables on Profitability (ROE):

Leverage and firms size (natural logarithm of assets) are control variables in this study. The results of pooled OLS estimation show negative relationship of leverage with profitability (ROE) while size is having a positive relationship with profitability (ROE). These results show that higher leverage or debt will have a negative impact on profitability while with a decrease in leverage, profitability will increase. Moreover positive relationship of size and profitability shows that with an increase in size, profitability also increases but a decrease in size will cause a decrease in profitability.

The findings of this study show that there is positive and insignificant relationship of average collection period and profitability. It demonstrates that more profitable firms have more cash to advance to customers. These firms advance cash for longer time period and charge high margin on it which increases the profitability. Also customers do not require more time to assess the quality of product to purchase it. It leads to the increase in receivables and collection period of these firms. However a negative and insignificant relationship is found between average payment period and profitability indicating that greater the time period of convertibility of payments into cash, lesser will be the profitability of firms. So in order to increase profitability, firms must have to reduce the average age of inventory.

A negative and significant relationship is found between average payment period and profitability which is supported by the view that as a firm takes more time to pay its payables, the credit worthiness of firm decreases which negatively impacts the profitability as less profitable firms due to shortage of cash take more time to pay their bills. Operating cycle and cash conversion cycle are having positive relationship with profitability but the relation of operating cycle with profitability is insignificant while cash conversion cycle is having a significant relationship with profitability. This positive relationship suggests that the blocked resources at different stages of supply chain lengthen the operating cycle. So as a result of increase in sales, profit increases because cost of the stuck capital is less than the benefits of holding the inventory. Also these firms are having relaxed credit policies and thus have higher receivables which results in longer cash conversion cycle.
Leverage and size are control variables in this study. Leverage is showing a negative relationship while size is having a positive relationship with profitability. The results of this study are not consistent with most of the previous studies due to the positive relationship of cash conversion cycle, operating cycle and average collection period and the negative relationship of average payment period with profitability.

5. RECOMMENDATIONS:
It is suggested 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.

6. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS:
The findings of this study are based on limited data for a limited period of time. I planned to take maximum number of firms but non availability of data restricted me to work with sample of 38 firms for a period of five years. Complete data relevant to the components of working capital was not available and most of the companies were having negative earnings. Such factors bound me to use return on equity as proxy of firm’s performance (profitability). This study explores the factors that affect the firm’s performance in terms of profitability of non-financial firms listed on Karachi stock exchange. There exists less work on working capital management in Pakistan and other developing countries so it should be further explored in developing countries and Pakistan as well. Also further components of working capital like cash, marketable securities, receivables and inventory management should be explored and their relationship with more proxies of profitability should be studied.

REFERENCES:


