

## **Determinants of Manufacturing Firms' Financial Performance in Pakistan**

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### **Abstract**

*Investment in working capital by and large shows better returns than investment in fixed assets. As such proper management of working capital rightfully attracts a lot of attention. The objective of this research is to examine the impact of size and working capital management efficiency on firms' financial performance using 10 years (2004-2013) secondary data of 153 firms listed on Pakistan Stock Exchange and employing regression and ratio analyses. Results show that performance-wise large firms are better whereas WCME-wise small and medium firms are better. These findings indicate that better performance of large firms is not because of efficient utilization of working capital - rather it may be due to some other factors and these firms can further improve their performance if working capital is managed more efficiently.*

**Keywords:** *Firms' performance, Firms' size, Market capitalization, Working capital management efficiency*

### **I. Introduction**

The importance of working capital may be found in the common practice being observed by suppliers of raw material and providers of credit who prefer to develop relationships with firms having the capacity and capability of timely meeting their short term obligations. On the other hand, firms maintaining low working capital to total assets ratios usually face serious cash flow problems and are unable to honor their short term liabilities despite earning high profits. Based on the nature of product, a major part of firms' resources are invested in short term assets. Certain industries like fertilizer and steel factories may have a high level of fixed assets and a lesser level of current assets however most of the consumer goods manufacturers have quite somewhat high percentage of their total assets held in the form of current assets. For example as per the data obtained from State Bank of Pakistan for 2004-13, average receivables are 11.91%, inventory 10.95% and payables 20.48% of total assets in (non-financial) corporate sector of Pakistan. Because of the volume of investment in current assets and quantum of current liabilities, effective and efficient working capital management (WCM) practices warrant greater attention from firms of all sizes. WCM indicates maintaining a healthy balance among current assets and liabilities with a view to maximize profit and improve

earnings per share. Because of huge investment in short term assets and liabilities, WCM has a significant impact on a firm's profitability (Deloof 2003). Fairly high variations are expected in the working capital management efficiency (WCME) and performance of firms due to their sizes. Larger firms must be technically, professionally, and size-wise stronger than small and medium firms to avail the benefits of scale economies. Due to their financial power, large firms significantly influence economies of their respective countries. This is also true in case of Pakistan where a large number of such firms operate (31.37% of the sample used in this study are large firms). This study, besides investigating the impact of WCME, also presents a comparison of financial performance among small, medium and large firms.

Theoretical base regarding liquidity maintenance can be found in Operating Cycle Theory (Park & Gladson, 1963), Agency Theory (Jensen & Meckling, 1976), Financing Theory (Emery, 1987) and Liquidity Theory (Nielson, 2002). Operating cycle theory advocates calculation of working capital requirements on the basis of 'natural business year'. According to agency theory, managers of large firms may prefer keeping higher level of working capital for operational convenience whereas in small firms their preference is for low levels of working capital. Lower levels of working capital mean lower financial costs but they demand greater management attention to keep the firm fully functional. On the other hand, higher level of working capital may mean lower profits due to less efficient use of current assets but they pose lesser strain on managers. In other words, agents may sacrifice a part of the profit (that belongs to principals) for the sake of their own convenience. Financing theory states that firms with greater probability of default prefer trade credit instead of cash loan from financial institutions. According to liquidity theory, firms having credit constraints (i.e. inability to raise cash loans from financial institutions) prefer trade credit which is avoided by firms having easy approach to cash credit. Easy access to trade credit reduces firms' dependence on cash financing of working capital through external sources. Working capital being an integral part of long term funds invested in current assets depends on the preference order of managers while selecting means of financing current assets. This is also advocated by (Myers & Mailuf, 1984).

## **2. Literature Review**

Fama and French (1992) used market capitalization (MC) as measure of portfolio size and found its strong positive relation with average returns. Majumdar (1997) found that older firms are more productive and less profitable, whereas larger firms are more profitable and less productive. Connor and Sehgal (2001) examined the impact of market, size and book to market ratio on stock returns using multivariate regression analysis and found that all these three factors (market, size and book to market ratio) explain stock returns. Dalbor, Kim and Upneja (2004) used number of owners, number of employees, age of firm, natural log of sales and natural log of assets as proxies of firms' size and examined their impact on volume of debt used by different firms. Number of owners is found to be the most significant variable to explain dependent variable. Du and Girma (2009) investigated the relationship between firm size and financial structure using number of employees as firms' size and found that financing source influence growth more in small firms as compared to large firms. They further found that internally

generated funds are more effective for promoting small firms and external finance is effective for large firms.

Ogundipe, Idowu and Ogundipe (2012) analyzed WCME among selected small and medium enterprises using regression analysis and found that small firms having weak liquidity position have to rely on credit facility and become insolvent, due to their weak financial performance and poor record keeping system. According to Zaremba and Konieczka (2015), the impact of illiquidity and transaction costs on value and size of firms is fatal in Central and Eastern European Countries' stock markets.

The available research investigating the impact of firms' size on WCME and financial performance is inadequate. Smith, (1973) found that the primary reason behind business failures is inappropriate use of the WCM techniques. Richards and Laughlin (1980) advocated CCC as a base for determining the actual working capital requirements of a firm. Deloof (2003) found that a firm value can be increased by reducing days receivable and taking long to pay their creditors. Gentry, Vaidyanathan and Lee (1990) investigated short term investments of firms by using weighted cash conversion cycle (WCCC) calculated as weighted operating cycle (WOC) minus weighted payable effect. They found that the larger the volume of investment in raw material and work in process, the longer the weighted operating cycle and vice versa. They further found that the larger the payable weight, the greater the deferral of payment to the suppliers and the shorter the weighted cash conversion cycle. This shows a positive relationship between inventory period and WOC and negative relationship between payment period and WCCC leading to a positive relationship between WCCC and firms' performance. Teruel and Solano (2007) found a negative relationship between average collection period and profitability of firms.

Previous studies indicate lack of adequate scientific research on investigating the impact of firms' size on WCME and ultimately profitability. These studies are more or less country specific as such may not have a general applicability. What financially and operationally sound firms do to manage their working capital which weak firms do not do and vice versa leading to variation in WCM practices. By finding and analyzing these factors, weak firms can learn a lot which can make them successful. The study uses CCC as comprehensive variable to measure WCME. The shorter the CCC, the higher will be firms' WCME which will lead to higher firms' profits. This study explores which size of firms' (small, medium or large) WCM practices is better besides determining the impact of size on profitability testing the following hypotheses:

**Hypothesis 1:** There is a positive relationship between firms' size and performance.

**Hypothesis 2:** Small firms are more efficient in utilizing WCME than larger firms.

### **3. Data**

Data set includes 153 firms listed on Pakistan Stock Exchange covering a period of ten years (2004-2013) for ten economic groups namely textiles, sugar, chemicals & pharmaceuticals, fuel & energy, autos & engineering, fast moving consumer goods (FMCGs) & foods, cement, paper & board, tobacco and jute. The sample does not include financial firms. The sample also excludes firms the industrial average (IA) of which is not available. Thus a panel data set of 1,530 firm-year observations has been obtained from State Bank of Pakistan's document "Balance Sheet Analysis" and published annual reports of firms. Sample is selected on disproportionate stratified

random sampling basis. Data is arranged and presented in pooled form combining time series and cross sectional observations. Time series in the study presents year wise determination of WCME and firm's performance measured by calculating various ratios for 10 years from 2004 to 2013 while cross sectional data covers determination of WCME and firm's performance measured by calculating various ratios separately for each year under review. Stratification is an efficient research design providing more information with a given sample size, as such used to meet the assessment requirements of each stratum in the universe. Industry-wise distribution of sample firms is given in table 1.

**Table 1: Industry-Wise Distribution of Sample Firms**

Industry	Small	Medium	Large	All firms
Textiles	20	13	2	35
Sugar	8	8	0	16
Chemicals	10	10	8	28
Fuel and Energy	0	5	14	19
Engineering	2	11	7	20
FMCGs	0	4	6	10
Cement	0	7	7	14
Paper and Board	3	1	2	6
Tobacco	1	0	2	3
Jute	2	0	0	2
Total firms	46	59	48	153

### 3.1 Variables in the Study

The details of dependent, independent, and control variables are given in table 2 below:

**Table 2: Variables**

Variable Type	Variable	Calculations
Dependent	Return on assets (ROA) , a measure of profitability in relationship with total assets/investment	Net profit divided by total assets
Independent	Market capitalization (MC) representing firms' size CCC, used as a comprehensive measure of WC management efficiency (Deloof, 2003) Inventory turnover in days (ITDs) Receivable turnover in days (RTDs), Payable turnover in days (PTDs)	Number of outstanding shares multiplied by market price per share (Inventory turnover in days + Receivable turnover in days) – Payable turnover in days (Inventory ÷ Cost of goods sold) x 365 (Receivables ÷ Sales) x 365 (Payables ÷ Purchases) x 365
Control	SG	(current year's sales - previous year's sales)/ previous year's sales

## 4. Analysis

### 4.1 Descriptive Analysis

As detailed in Table 3, average RoA of small, medium and large firms is 2.76%, 7.43% and 16.92% respectively showing highest performance of large firms. A narrow range between mean and standard deviation of RoA in large firms indicate stable profits in these firms. Average CCC of small and medium firms is 50.75 days whereas that of large firms 31.65 days. These compared with standard deviations of 191.54 for small, 146.56 for medium and 106.91 for large firms shows high variability in working capital management efficiencies. However size of CCC indicates efficient utilization of working capital by large firms. At an average, small firms take 122.55 days, medium 97.23 days and large firms 101.71 days to convert their inventory into finished goods. On average, small firms allow a credit period of 47.15 days, medium firms 41.52 days and large firms 45.27 days to their customers. Small firms take a longest period of 117.62 days to make payment to their suppliers followed by medium firms taking 91.19 days and large firms 70.03 days. As such medium firms are efficient in terms of inventory conversion and credit recovery whereas small firms are efficient to avail a longer period to utilize suppliers' funds. Average sales growth is 24% for small and 20% for medium and large firms.

**Table 3: Descriptive Statistics**

Variable	Size	Mean	Standard Error	Median	Standard Deviation
RoA	Small	2.76	0.76	1.43	16.39
	Medium	7.43	0.50	6.17	12.39
	Large	16.92	0.73	13.82	15.70
MC	Small	46.54	16.85	0.00	361.01
	Medium	23.87	3.75	3.55	92.62
	Large	31.01	5.82	11.59	124.85
CCC	Small	50.75	8.93	64.91	191.54
	Medium	50.75	5.93	65.97	146.56
	Large	31.65	4.98	17.65	106.91
ITDs	Small	122.55	6.76	84.75	145.08
	Medium	97.23	4.43	80.50	109.38
	Large	101.71	13.75	41.23	294.96
RTDs	Small	47.15	5.20	26.31	111.52
	Medium	41.52	2.59	23.90	63.86
	Large	45.27	3.37	14.66	72.28

PTDs	Small	117.62	10.44	52.83	223.91
	Medium	91.19	8.46	46.72	208.88
	Large	70.03	3.47	52.46	74.36
SG	Small	0.24	0.04	0.13	0.85
	Medium	0.20	0.03	0.14	0.77
	Large	0.20	0.03	0.16	0.54

#### 4.2 Correlation Analysis

Correlation analysis reported in Table 4 shows positive and significant relationship between CCC and RoA which contradicts the results of previous studies (Gentry, Vaidyanathan & Lee, 1990; Teruel & Solano, 2007; Ogundipe, Idowu and Ogundipe, 2012). This is due to high inefficient working capital utilization by overall Pakistani corporate sector (an efficient and non efficient ratio of 25:75). We further investigated the relationship of CCC components (ITDs, RTDs and PTDs) with RoA and found a strong negative relationship between PTDs and RoA which contradicts the finding of Deloof (2003) and indicates that the main inefficiency lies in availing trade credit in the form of payables.

**Table 4: Correlations among Variables**

Variables	RoA	MC	CCC	ITDs	RTDs	PTDs	SG
RoA	1	.013	.069 <sup>**</sup>	-.051 <sup>*</sup>	-.060 <sup>*</sup>	-.176 <sup>**</sup>	.049
MC	.013	1	.009	.014	-.006	-.005	.003
CCC	.069 <sup>**</sup>	.009	1	.108 <sup>**</sup>	.170 <sup>**</sup>	-.621 <sup>**</sup>	-.039
ITDs	-.051 <sup>*</sup>	.014	.108 <sup>**</sup>	1	.156 <sup>**</sup>	.276 <sup>**</sup>	-.061 <sup>*</sup>
RTDs	-.060 <sup>*</sup>	-.006	.170 <sup>**</sup>	.156 <sup>**</sup>	1	.369 <sup>**</sup>	.026
PTDs	-.176 <sup>**</sup>	-.005	-.621 <sup>**</sup>	.276 <sup>**</sup>	.369 <sup>**</sup>	1	.002
SG	.049	.003	-.039	-.061 <sup>*</sup>	.026	.002	1

#### 4.3 Multivariate Analysis

In this section, panel diagnostic tests and models used for multivariate analysis are presented. In order to bring conformity in results, pooled OLS model having the benefit of covering dummies as well as all those variables included in fixed effects model is used. The following model is used separately to estimate the results for small, medium and large firms:

$$RoA_{it} = \beta_0 + \beta_1 (MC) + \beta_2 (CCC) + \beta_3 (ITDs) + \beta_4 (RTDs) + \beta_5 (PTDs) + \beta_6 (SG) + \varepsilon \quad (1)$$

Multicollinearity is checked using tolerance values. Previous studies indicate that data having tolerance value less than 2 have no problems of multicollinearity (for example Robert, 2007). Tolerance values for the data used in this study are well below the required levels for all variables (table 5), as such no multicollenearity problem exists. Park test (Park, 1966) is used to check heteroscedasticity in all regressions. Based on the results of Cumulative Sum (CUSUM) recursive coefficients test (test used to check model stability), the model used for estimating the results is stable

**Table 5: Tolerance Values**

Segment	MC	CCC	ITDs	RTDs	PTDs	SG
Small firms	0.997	.106	.229	.230	.080	0.933
Medium firms	.991	.267	.447	.472	.140	.983
Large firms	.974	.529	.886	.575	.572	.985

**4.4 Regression Results**

Table 6 reports size-wise regression results. CCC has a negative relationship with firms' performance in medium and large firms however insignificant. WCME is further investigated by regressing firms' performance separately with ITDs, RTDs and PTDs. Regression results show inefficiency in working capital by Pakistani corporate sector in terms of payment to suppliers as evident from a significant negative relationship of PTDs with firms' performance in medium and large firms (which constitutes around 70% of the sample size). Inventory is being efficiently utilized only by small firms as indicated by a negative relationship of ITDs with RoA significant at 10%. These results suggest an important role of WCME in determining firms' performance. The main reason of negative relation between PTDs and profitability seems to be forced maintenance of high current ratio because of State Bank's (Central bank) rules. Large firms being able to negotiate better terms with their suppliers and get longer credit periods are still struggling to improve their PTDs. These findings are supported by Chong and Hwang (2015) that high-risk borrowing firms and firms with a greater cash flow are more likely to use trade credit in lieu of short-term financing.

**Table 6: Regression Results**

Variables	Size	Coefficient	Standard Error	t-Statistic	Prob.
C	Small	3.690	1.121	3.293	0.001
	Medium	7.432	0.780	9.529	0.000
	Large	15.173	1.471	10.312	0.000
MC	Small	0.001	0.002	0.497	0.619
	Medium	0.009	0.005	1.606	0.109
	Large	0.008	0.006	1.348	0.178
CCC	Small	0.014	0.012	1.148	0.251
	Medium	-0.002	0.008	-0.181	0.857
	Large	-0.002	0.009	-.174	0.862
ITDs	Small	-0.020	0.011	-1.790	0.074
	Medium	0.015	0.010	1.550	0.122
	Large	-0.002	0.003	-0.831	0.407
RTDs	Small	-0.012	0.014	-0.805	0.421
	Medium	0.001	0.012	-0.027	0.979
	Large	0.003	0.013	0.234	0.815
PTDs	Small	0.005	0.012	0.382	0.703
	Medium	-0.180	0.009	-2.087	0.037
	Large	-0.038	0.012	-3.071	0.002

	Small	1.334	0.923	1.445	0.149
SG	Medium	0.883	0.646	1.367	0.172
	Large	0.615	1.303	0.472	0.637

#### 4.5 Ratio Analysis

Table 7 summarizes good and weak performing firms comparing average RoA for each firm with its respective IA. Firms with return on assets equal to or more than IA are considered as good performing firms and less than IA or negative (even if it is more than IA), as weak performing firms.

**Table 7: Firms' Performance**

Data Segment	Good performing firms		Weak Performing Firms		Total firms	
	Number	%	Number	%	Number	%
Small firms	16	35	30	65	46	100
Medium firms	30	49	31	51	46	100
Large firms	31	67	15	33	46	100
Total firms	77	50.33	76	49.67	153	100

Table 7 reports 50.33% good performing firms and 49.67% weak performing firms. The performance of large firms is highest with 67% good performing ratio as compared to 49% for medium and 35% for small firms showing a positive relationship between firms' size and performance. This supports our hypothesis 1 that 'There is a positive relationship between firms' size and performance'.

The study uses CCC as a comprehensive proxy of WCME. Average CCC of each firm for the sample period is compared with IA. All firms maintaining average cash conversion cycles less than IA are considered to be managing their working capital efficiently. Firms having average cash conversion cycles equal to or more than IA are considered to be managing their working capital inefficiently. Comparing profitability and CCC with IA is in line with that used by Singh (2011). Table 8 reports, classification of efficient and non efficient firms on the basis of working capital utilization.

**Table 8: Efficiency-wise Distribution of Firms**

Segmentation	Efficient firms		Non efficient firms		Total	
	Number	%	Number	%	Number	%
Small firms	17	37	29	63	46	100
Medium firms	13	21	48	79	61	100
Large firms	9	20	37	80	46	100
All firms	39	25	114	75	153	100

#### 5. Conclusions

We investigated the impact of size on WCME along with variations in firms' performances (because of this impact) using ratio, descriptive, correlation and regression analyses. Results show that performance-wise large firms are better whereas WCME-wise small and medium firms are better. These findings indicate that better performance of large firms is not because of efficient utilization of working capital - rather it may be

due to some other factors and these firms can further improve their performance if working capital is managed more efficiently. Overall Pakistani corporate sector is highly inefficient in utilizing working capital. This aspect is perhaps influenced by the presence of sizable number of large firms (which are inherently less efficient in WCM) in the sample size.

CCC has a negative but insignificant relationship with firms' performance in medium and large firms. Regression results show inefficiency in working capital by Pakistani corporate sector in terms of payment to suppliers as evident from a significant negative relationship of PTDs with firms' performance in medium and large firms (which constitutes around 70% of the sample size). Inventory is being efficiently utilized only by small firms as indicated by a negative relationship of ITDs with RoA significant at 10%. These results suggest an important role of WCME in determining firms' performance. The main reason of negative relationship between PTDs and profitability seems to be forced maintenance of high current ratio because of State Bank's rules. Large firms being able to negotiate better terms with their suppliers and get longer credit periods are still struggling to improve their PTDs.

These findings lead to a two-way learning process among small, medium and large firms. Small and medium firms can learn from large firms about how to maximize their value – while large firms can learn from small and medium firms about how to improve their WCME. Future research is recommended to find out ways for small and medium firms to maximize their value and large firms to improve their WCME.

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