

Impact of Working Capital Management on Profitability: A Study of Auto and Textile Industry

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Abstract—

In this paper, we have tried to find out the impact of working capital management on the profitability of the manufacturing sector emphasizing the Textile and Auto industries. For this, secondary data relating to randomly sampled companies from auto and textile sector was used. Analysis was made on the basis of data descriptive statistical analysis, Pearson correlation and pooled ordinary least square regression type panel data analysis. The study leads us to conclude that, in spite of similar nature of both the industries of manufacturing sector, working capital variables affect profitability indices more strongly in auto industry than in the textile industry.

Keywords— Return on Assets, Net Operating Profitability, Net Profit Margin, Gross Profit Margin, Return on Equity

I. INTRODUCTION

Working capital may be considered as the lifeblood of any business unit because it constitutes a cyclically flowing stream through the business organism. Working capital may be regarded as moving capital and represented by the excess of current assets over current liabilities and identifies the relatively liquid portion of any business unit [1]. The portion of current assets which have not been supplied by current and short term creditors in an organization is termed as working capital [2]. Management of working capital is a crucial task for every industry, especially for manufacturing concerns, because half of the capital of these concerns is used as working capital [3]. Various research studies on this subject have contended that ineffective management of working capital not only reduces profitability of the firm but may also cause industrial sickness; therefore, firms should maintain an optimum level of working capital in order to maximize their value [4]. A very fundamental but important concept that a manager should keep in mind is that lesser the time a company needs to realize cash from its customers; the better it is for the liquidity position of the company and reduces the risk of dependency on external sources of finance to meet their short-term obligations [5]. This study is an attempt to find out the relationship between working capital management and profitability and also to measure the impact of working capital management on profitability.

II. LITERATURE REVIEW

Working capital management deals with the management of current assets and current liabilities and is considered as very important parameter in corporate finance. It is worth to say that working capital works as the lifeblood of an organization and its efficient management can ensure the success and the sustainability of the firm while inefficiency may lead to bankruptcy [6]. Efficient management of working capital is proved to be a significant parameter in overall corporate strategy for creating value for shareholders [3], [7]. It directly affects the profitability and liquidity of the firm [3], [8]-[10]. Working capital management has a direct relation with the performance of a company; poor management may result into deteriorated performance and increased bankruptcy risk and as a result liquidity problems arise [8]. One of the study related to the effect of working capital management on firm bankruptcy probability listed on Tehran Stock Exchange found a negative relationship among them mentioning that an efficient management of working capital reduces the risk of bankruptcy [11].

Working capital management adds to corporate profitability and shareholders' value. The indicators of working capital management had a very remarkable impact on the profitability of firms [12]. By managing working capital effectively, a company can increase the net present value of its cash flows, thus adding to shareholders value [13]-[14] and hence, to profitability.

The way of managing working capital can have a significant impact on both the liquidity and profitability of the company [3], [7]-[10]. The main purpose of any firm is to maximize its profit without compromising with the liquidity. Theoretically, liquidity and profitability are the two main objectives of working capital management and a negative association is expected between these, signifying that a firm having more current assets is more liquid [15]-[18]. Contrary to these findings, there are certain studies, which conclude that higher the liquidity, more profitable the firm is [19]-[20]. However, Kumar et al. found no significant link between liquidity and profitability in his study [21].

Ramudu and Rao in their reports have revealed that studies related to working capital management as whole should necessarily discuss the individual components of working capital and hence, exclusive studies on individual components of current assets and current liabilities are found to be very few. Various measures of working capital affect profitability differently and thus, this becomes necessary to identify the variables that affect profitability the most [22]-[24]. Their reports have established the fact that rather than size, nature and geographical location of the firms, there were various factors which were affecting need of working capital. To improve these factors, companies must set a trade-off between

profitability and liquidity so that neither the liquidity nor profitability gets suffered [25]. Moreover, this improvement can also be accompanied by reducing the cash conversion cycle, which can be in turn, achieved by decreasing the debtors' collection and inventory holding periods and at the same time increasing the creditors' referral period [24].

III. OBJECTIVES

This study is an attempt to focus on the relationship between working capital management and profitability and also to find out the impact of working capital on the profitability of similar nature of two manufacturing sector industries i.e. textile and auto industry.

IV. HYPOTHESES

Based on the findings of the literature reviewed, following hypotheses have been formulated for this study:

- There is no significant relationship between working capital management and profitability.
- There is no significant impact of working capital on the profitability of textile and auto industry.

V. DATA AND METHODOLOGY

The present study is based entirely on the use of secondary data relating to randomly sampled 17 companies from auto and 37 companies from textile sector. Twenty % of the total companies listed on BSE- 500 of auto and textile sector have been taken for study. Data used in this study was sourced primarily from BSE-500, internet and websites of different companies, based on net profit and for a period of fourteen years from 2000 to 2013.

For analysis, the sampled are subjected to data descriptive statistical analysis, Pearson correlation and pooled ordinary least square regression type panel data analysis.

A. Research Variables and Their Measurement

In order to analyze the relationship between working capital management and profitability and impact of working capital on the profitability of manufacturing sector in India, profitability measures (return on assets, net operating profitability, net profit margin, gross profit margin and return on equity) are used as dependent variable. In connection to independent variables, working capital management is measured using receivables collection period, inventory conversion period, payable deferral period, cash conversion cycle, current assets to total assets ratio and current liabilities to total assets ratio. Together with these variables, control variables are also included, such as debt ratio, firm size, current ratio and quick ratio.

Variable	Measurement	Abbreviation
Dependent Variables		
Return on Assets	Net Profit/Total Assets	ROA
Net Operating Profitability	(Earnings before Interest and Tax + Depreciation)/Total Assets	NOP
Net Profit Margin	Net Profit/ Sales	NPM
Gross Profit Margin	Gross Profit/Sales	GPM
Return on Equity	Net Profit/Total Equity	ROE
Independent Variables		
Receivables Collection Period (in days)	Accounts Receivable/Net Sales*365	RCP
Inventory Conversion Period (in days)	Inventory/Cost of Goods Sold*365	ICP
Payment Deferral Period (in days)	Accounts Payable/Purchases*365	PDP
Cash Conversion Cycle (in days)	RCP+ICP-PDP	CCC
Current Assets to Total Assets ratio	Current Assets/Total Assets	CATA
Current Liabilities to Total Assets ratio	Current Liabilities/Total Assets	CLTA
Control Variables		
Debt Ratio	Total Debt/Total Assets	Debt Ratio
Firm Size	Natural Logarithm of Sales	Firm Size
Current Ratio	Current Assets/Current Liabilities	CR
Quick Ratio	Current Assets-Stock/Current Liabilities	QR

B. Regression Specifications

Pooled ordinary least square panel data analyses are used in the study to find out the combined effect of working capital management on profitability. Accordingly, all profitability measures are taken as dependent variable one by one for all industries used in the study.

The first regression equation is:

$$ROA_{it} = \beta_0 + \beta_1 (RCP_{it}) + \beta_2 (ICP_{it}) + \beta_3 (PDP_{it}) + \beta_4 (CCC_{it}) + \beta_5 (CATA_{it}) + \beta_6 (CLTA_{it}) + \beta_7 (Debt\ Ratio_{it}) + \beta_8 (Firm\ Size_{it}) + \beta_9 (CR_{it}) + \beta_{10} (QR_{it}) + \varepsilon$$

The second regression equation is:

$$NOP o_t = \beta_0 + \beta_1 (RCP o_t) + \beta_2 (ICP o_t) + \beta_3 (PDP o_t) + \beta_4 (CCC o_t) + \beta_5 (CATA o_t) + \beta_6 (CLTA o_t) + \beta_7 (Debt Ratio o_t) + \beta_8 (Firm Size o_t) + \beta_9 (CR o_t) + \beta_{10} (QR o_t) + \varepsilon$$

The third regression equation is:

$$NPM o_t = \beta_0 + \beta_1 (RCP o_t) + \beta_2 (ICP o_t) + \beta_3 (PDP o_t) + \beta_4 (CCC o_t) + \beta_5 (CATA o_t) + \beta_6 (CLTA o_t) + \beta_7 (Debt Ratio o_t) + \beta_8 (Firm Size o_t) + \beta_9 (CR o_t) + \beta_{10} (QR o_t) + \varepsilon$$

The fourth regression equation is:

$$GPM o_t = \beta_0 + \beta_1 (RCP o_t) + \beta_2 (ICP o_t) + \beta_3 (PDP o_t) + \beta_4 (CCC o_t) + \beta_5 (CATA o_t) + \beta_6 (CLTA o_t) + \beta_7 (Debt Ratio o_t) + \beta_8 (Firm Size o_t) + \beta_9 (CR o_t) + \beta_{10} (QR o_t) + \varepsilon$$

The fifth regression equation is:

$$ROE o_t = \beta_0 + \beta_1 (RCP o_t) + \beta_2 (ICP o_t) + \beta_3 (PDP o_t) + \beta_4 (CCC o_t) + \beta_5 (CATA o_t) + \beta_6 (CLTA o_t) + \beta_7 (Debt Ratio o_t) + \beta_8 (Firm Size o_t) + \beta_9 (CR o_t) + \beta_{10} (QR o_t) + \varepsilon$$

VI. DESCRIPTIVE ANALYSIS

Descriptive analysis of the data includes the mean, median, standard deviation, minimum and maximum values of different variables of interest, used in the study. It provides the detailed information about each relevant variable.

A. Textile Industry

The mean, median, minimum and maximum values with standard deviation of different variables for different Textile companies during the period 2000 to 2013 have been presented in the Table 1.1. The mean value of ROA is 6 per cent of total assets and standard deviation is 4 per cent. This value of standard deviation signifies that value of ROA can deviate from mean to both sides by 4 %. NOP of the companies is on an average 16 %. Descriptive statistics show that NPM and GPM of companies, included in the study, are very low (6 % and 7 %, respectively). The average value of ROE (measured as profit before taxation/total shareholder equity) is 100 %.

Companies receive payment against sales after an average of 100 days with standard deviation of 57 days. It takes on an average 109 days to sell inventory with a standard deviation of 198 days. Here, maximum time taken by a company to release inventory is 318 days, which is a very long duration to convert inventory into sales. Companies wait 298 days with a standard deviation of 99 days to pay their purchases. To check the efficiency in managing working capital, cash conversion cycle is used, which is on an average 76 days with standard deviation 183 days.

Current assets to total assets ratio is a measure of the companies' degree of conservativeness in working capital investment policy while current liabilities to total assets ratio is a measure of working capital financing policy. The results of descriptive statistics show that proportion of current assets to total assets and current liabilities to total assets is 49 % and 36 %, respectively. To check the debt financing and its relationship with the profitability, the debt ratio is used. Average debt ratio for Textile companies is 67 % with a standard deviation of 7.85. To check the size of the firm, natural logarithm of sales is used. Mean value of log of sales is 2 while the standard deviation is 1. In the same way, to check the liquidity of the company current ratio and quick ratio are used.

B. Auto Industry

Table 1.2 that the auto companies on an average have 10 % and 26 % ROA and NOP, respectively with respective standard deviation of 22 % and 23 %. GPM is 11 % while NPM is very low (5 %). Auto companies on an average have 43 days of cash conversion cycle with standard deviation of 150 days. Companies have an average collection period of 65 days, inventory conversion period of 60 days and average payment period of 82 days. In this study, the results show that the Auto companies included in this study are conservative in both their working capital policies (investment and financing) as proportion of current assets and current liabilities to total assets is 58 % and 45 %, respectively. Debt to equity ratio of the companies is 38 % and firm size (logarithm of sales) is 2.578. On average, Auto companies kept current assets 1.39 times the current liabilities. The liquidity ratio (quick) at 0.86 shows that current assets net of inventories to current liabilities is kept at 0.8:1.

VII. CORRELATION ANALYSIS

Correlation is a statistical parameter, which is used to find out the nature of relationship between variables, such as between working capital management and profitability, as in present case.

A. Textile Industry

Correlation matrix for Textile industry of all variables included in the analysis is presented in Table 2.1. This table shows that ROA is negatively associated with all measures of working capital management (i.e. receivables collection period, inventory conversion period, payable deferral period, current assets to total assets ratio, current liabilities to total assets ratio, debt ratio and firm size) except cash conversion cycle and liquidity ratios (current ratio and quick ratio). The coefficients of correlation between all measures of working capital management and profitability are insignificant except for debt ratio. These results are inconsistent with traditional view and belief that timely payment to suppliers, collecting payment from customers earlier and keeping available inventory in stock for lesser time are associated with increase in profitability. Correlation coefficient between financial debt ratios and ROA discerns significant negative relationship, which entails that increase in debt utilization by the companies will reduce profitability. Also, correlation coefficient between second measure of profitability (NOP) and all measures of working capital management is insignificant, which is also against traditional belief.

NPM has a positive significant relation with current ratio and quick ratio (traditional measures of checking liquidity of the companies). It indicates that liquidity and profitability have a direct relationship, means profitability increases with increase in liquidity. Moreover, GPM (fourth profitability measure) and ROE (fifth profitability measure) both show a significant positive correlation with firm size, which indicates that bigger size companies are more profitable.

Correlation matrix 2.1 reflects high correlation between different measures of working capital management. The coefficient of correlation between receivables collection period (RCP) and cash conversion cycle (CCC) is 0.165, RCP and Firm Size is -0.178 and coefficient of correlation of ICP with PDP, CCC, CATAR, CLTAR and firm size is 0.907, -0.836, 0.150, 0.205 and -0.200, respectively. Also, respective coefficient of correlation of PDP with CCC, CLTAR, Debt Ratio and Firm Size is -0.979, 0.149, 0.126 and -0.363. Rather than these results, correlation of CCC with CLTAR and debt ratio is negatively significant and CATAR with CLTAR is positively significant. Also, correlation between liquidity ratios (i.e. current ratio and quick ratio) is positively significant at 0.01 levels. However, to avoid multi-linearity problem, these relationship between different measures of working capital management has not been taken into account.

B. Auto Industry

Table 2.2 presents Pearson-correlation coefficients of Auto industry for all variables considered. The result of analysis of correlation between ROA and inventory conversion period shows a negative coefficient -0.202 at 1 % significant level. Further, ROA shows a negative correlation with both current assets to total assets ratio and current liabilities to total assets ratio. It means that if the contribution of current assets as well as current liabilities increases in total assets profitability also increases. Like ROA, NOP also shows a significant negative correlation with inventory conversion period. There exists a negative but insignificant relationship between ROA and liquidity ratios. Relationship is insignificant but negative sign make economic sense that as liquidity increases profitability decreases and vice-versa. Also, financial debt ratio is significantly negatively correlated with ROA and NOP. However, firm size shows a positive significant correlation with both ROA and NOP. It implies that the size is associated with increase in the performance of the companies. In this analysis, liquidity ratios (current ratio and quick ratio) have a significant negative relationship with NOP. The result is significant at 0.01 levels. It indicates that liquidity and profitability have inverse relationship. So, the companies need to maintain a tradeoff between these two measures.

A significant positive correlation between cash conversion cycle and NPM is inconsistent with the view that shorter the cash conversion cycle, higher its benefits. NPM also has a significant positive correlation with current assets to total assets ratio and current liabilities to total assets ratio. Financial debt ratio is negatively associated with NPM, which means increase in the financial leverage leads to decrease in the NPM of Auto companies. We find a significant positive correlation of GPM and the receivables collection period, payable deferral period, inventory conversion period. In the same way, the correlation with cash conversion cycle is positive and significant. This demonstrates that paying suppliers' earlier, collecting payments from customers earlier, and keeping products in stock less time, are all associates with decrease in GPM, i.e. profitability of Auto industry, which is a disagreement with common belief. Also, GPM has a significant positive correlation with proportion of current assets and current liabilities to total assets. ROE is negatively associated with inventory conversion period, financial debt ratio and quick ratio whereas positively associated with the firm size.

VIII. REGRESSION ANALYSIS

A. Textile Industry

Table 3.1.1 presents six regression equations, one each for the core measures (receivables collection period, inventory conversion period, payable deferral period, cash conversion cycle, current assets to total assets ratio and current liabilities to total assets ratio) of working capital management along with four control variables (debt ratio, firm size, current ratio and quick ratio). Regression analysis presented in Tables 3.1.1 to 3.1.5 of Textile industry, the measures of working capital management are regressed one by one against the profitability measures used in the study. A total of five regressions are made to investigate the determinants of working capital management measures against each profitability measure (i.e. ROA, NOP, NPM, GPM and ROE). It is evident from Table 3.1.1 that in regression 1, ROA is regressed against receivables collection period as a measure of collection policy of Textile industry. The association of receivables collection period with ROA in regression 1 is negative (-0.000024) and insignificant. Association between ROA and other measures included in Regression 1 is found insignificant, except with Current Ratio which is significantly positively associated (0.02617) and debt ratio which is significantly negatively associated (-0.0061). In Regression 2, the set of independent variables is same as that in Regression 1, except for substitution of receivables collection period with inventory conversion period. Inventory conversion period has insignificant positive impact on ROA. Regression 3 is run using the payable deferral period as the replacement of inventory conversion period. The association between payable deferral period and ROA is insignificant but positive sign make an economic sense that longer time to make payment to credit suppliers will enhance profitability. In regression 4, the payable deferral period is replaced by the cash conversion cycle. Coefficient of regression between ROA and cash conversion cycle is positive and insignificant (0.00000214). In Regression 5, cash conversion cycle is replaced by current assets to total assets ratio. In regression 6, the current assets to total assets ratio is replaced by current liabilities to total assets ratio. Regression analysis of ROA with CATAR and CLTAR in regression 5 and regression 6 respectively, is insignificant (-0.01, 0).

Table 3.1.2 presents the regression results of NOP against core working capital management variables along with control variables. The regression results show that all core working capital management measures are insignificantly associated with NOP. Among control variables, current ratio has a significant positive association (0.03296), while debt

ratio, firm size and quick ratio are insignificantly associated with NOP. It indicates that more liquidity in Textile industry will enhance operating profitability.

Working capital management measures of Textile industry are also regressed against NPM, GPM and ROE. Results of these regressions are presented in Table 3.1.3, 3.1.4 and 3.1.5, respectively. Regressions 1 to 6 in Tables 3.1.3, 3.1.4 and 3.1.5 show that NPM and ROE are insignificantly associated with working capital management measures. However, GPM has a significant positive association with payable deferral period (0.000284) and negative association with cash conversion cycle (-0.00034). It means that longer time the company takes to make payment to their suppliers, a big amount of working capital it may reserve and use to improve profitability [26]. Negative association between cash conversion cycle and profitability is consistent with the view that decreasing the cash conversion cycle will generate more profits for Textile industry [27].

The value of R² indicates variations in the profitability of the Textile companies due to selected working capital management variables. F statistics is used to test the significance of R. Also, there is no autocorrelation problem as Durbin-Watson value lies between 1 and 3 which represents zero autocorrelation.

B. Auto Industry

Tables 3.2.1 to 3.2.5 present results of five profitability measures used in the study regressed against core variables of working capital management along with four control variables of Auto industry. The results of regression analysis in Table 3.2.1 show that coefficient of receivables accounts period is significantly positively (0.0002) with the dependent variable ROA. It is against the assumptions, and indicates that any increase in receivables collection period increases profitability of Auto companies. However, inventory conversion period has a significant negative association (-0.0006) with ROA and hence, suggests that by reducing the number of days of inventory conversion period, companies can increase profitability. Payable deferral period coefficient is insignificant in Table 3.2.1 of Auto industry. The coefficient of the variable cash conversion cycle is positive and significant (0.0002). Thus, higher value of cash conversion cycle will increase profitability. Current assets to total assets ratio shows a significant positive relationship with ROA indicating that the Auto companies, in general, are following conservative policy of working capital management. Current liabilities to total assets ratios also have a significant positive association (0.04396) with ROA signifying that Auto companies are financing their working capital with short term loans.

Among control variables, financial debt ratio is negatively associated with ROA meaning thereby increase in financial leverage results in decrease in ROA, i.e. profitability of the companies. Firm size measured by logarithm of sales is used in the regression model as this log transformation reduces influences of outliers. Size of the companies is positively related to profitability and is significant implying that larger size companies are earning huge profits adding to their profitability. The current ratio and quick ratio, which are the theoretical measure of liquidity, have laid no significant impact on profitability.

Table 3.2.2 presents almost similar results as presented in Table 3.2.1 except that payable deferral period has a significant negative relation with profitability. It implies that longer the time a company takes to make payment to creditors, the higher level of working capital it may reserve to meet their short term liabilities and use to improve profitability. In Table 3.2.3, similar coefficients for receivables collection period, cash conversion cycle, current assets to total assets ratio and current liabilities to total assets ratio are positive and significantly associated with NPM. Also, inventory conversion period and payable deferral period are associated positively with NPM at no significant level. Financial debt ratio has a negative relation with NPM, while firm size has positive relation.

Regression analysis presented in Table 3.2.4 indicates that all the indicators of core working capital management are found to be positively related with GPM at a very high degree of significance. It indicates that reducing the receivables, inventories, payables and cash conversion cycle period result in decreasing the GPM of Auto companies. While doing regression for dependent variable ROE against independent variables in Table 3.2.5, only three control variables, i.e. debt ratio, firm size and current ratio have shown a statistically significant relationship. Other measures of working capital management are insignificantly related with ROE. Durbin-Watson statistics is also close to zero in all regression tables of Auto industry, which implies that successive values of estimated residuals are not dependent on each other. It indicates that there is no Auto-correlation problem in the estimated regression equations.

IX. CONCLUSIONS

Working capital management is particularly important in case of manufacturing sector companies because it comprises almost half of the capital. Companies have enough scope to better their performance by efficiently managing their working capital. The analysis leads us to conclude that, in spite of similar nature of both the industries manufacturing sector working capital variables affect profitability indices more strongly in auto industry than in the textile industry.

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TABLE 1.1 MEAN, MEDIAN, MINIMUM AND MAXIMUM VALUES WITH STANDARD DEVIATION OF DIFFERENT VARIABLES FOR TEXTILE INDUSTRY DURING 2000 TO 2013

Variables	Mean	Median	Maximum	Minimum	Standard Deviation	Observations
ROA	0.06064	0.033	6.389	-1.175	0.4075	505
NOP	0.167	0.138	7.133	-1.101	0.385	505
NPM	0.068	0.029	88.452	-40	4.683	505
GPM	0.0771	0.107	1.083	-109	5.282	505
ROE	1.007	0.214	35.53	-7.72	3.531	505
RCP (in days)	100.84	48.55	596	0.00	57.14	505
ICP (in days)	109.492	82.13	318.56	0.00	198.73	505
PDP (in days)	298.88	69.35	1390	0.00	99.5	505
CCC (in days)	76.91	64.24	10140	-31025	183	505
CATAR	0.494	0.407	12.34	-0.969	0.741	505
CLTAR	0.36	0.185	28.375	-5.062	1.8761	505
Debt Ratio	0.6741	0.527	155	-48	7.8576	505
Firm Size	2.000	2.2	4.3	-2	1.000	505
CR	1.4400	0.94	20.1	0	1.85	505
QR	2.072	1.56	46.51	0	3.113	505

TABLE 1.2 MEAN, MEDIAN, MINIMUM AND MAXIMUM VALUES WITH STANDARD DEVIATION OF DIFFERENT VARIABLES FOR AUTO INDUSTRY DURING 2000 TO 2013

Variables	Mean	Median	Maximum	Minimum	Standard Deviation	Observations
ROA	0.101	0.086	1.558	-1.3	0.221	238
NOP	0.262	0.233	0.987	-1.055	0.235	238
NPM	0.05	0.048	0.754	-0.244	0.085	238
GPM	0.1122	0.1105	1.334	-0.176	0.131	238
ROE	3.602	1.192	59.54	-2.18	8.106	238
RCP (in days)	65.81	46.72	1365	0.37	149.8	238
ICP (in days)	60.388	53.29	246.01	1.46	40.933	238
PDP (in days)	82.882	76.105	274.85	8.4	37.152	238
CCC (in days)	43.315	23.365	1292.8	-130.3	150.44	238
CATAR	0.588	0.506	4.043	-5.727	0.633	238
CLTAR	0.45	0.383	3.79	-8.809	0.75	238
Debt Ratio	0.3869	0.39	2.401	-4.312	0.423	238
Firm Size	2.578	2.474	4.376	1.399	0.628	238
CR	1.396	1.065	6.18	0.24	1.086	238
QR	.86	0.94	4.51	0.15	0.922	238

TABLE 2.1 PEARSON CORRELATION COEFFICIENTS OF WORKING CAPITAL MANAGEMENT AND PROFITABILITY MEASURES OF TEXTILE INDUSTRY

Variables		ROA	NOP	NPM	GPM	ROE	RCP	ICP	PDP	CCC	CATAR	CLTAR	DEBT RATIO	FIRM SIZE	CR	QR
ROA	Pearson Correlation	1														
NOP	Pearson Correlation	.809**	1													
NPM	Pearson Correlation	.173**	.129*	1												
GPM	Pearson Correlation	0.001	0.034	.412*	1											

	n			*													
ROE	Pearson Correlation	.308**	.214*	.133*	0.022	1											
RCP	Pearson Correlation	-0.018	-0.034	-0.023	-0.105*	-0.004	1										
ICP	Pearson Correlation	-0.036	-0.051	-0.025	-0.004	-0.003	0.002	1									
PDP	Pearson Correlation	-0.046	-0.047	-0.032	-0.013	-0.004	-0.008	.907**	1								
CCC	Pearson Correlation	0.042	0.037	0.027	-0.031	0.001	.165**	-.836**	-.979**	1							
CATA	Pearson Correlation	-0.002	0.006	0.023	0.018	-0.001	0	.150**	0.058	-0.021	1						
CLTA	Pearson Correlation	-0.033	0.014	-0.011	-0.011	0	-0.013	.205**	.149**	-.122**	.908**	1					
DEBT RATIO	Pearson Correlation	-.121**	0.003	0.017	0.019	-0.002	0.008	0.055	.126**	-.142**	-0.002	.281**	1				
FIRM SIZE	Pearson Correlation	-0.028	0.047	0.018	.249*	.098*	-.178**	-.200**	.363**	.313**	-.123**	-.131**	-0.029	1			
CR	Pearson Correlation	0.039	0.027	.363*	-0.039	0.0056	0.045	-0.031	-0.035	0.042	-0.026	-0.025	-0.013	-.242*	1		
QR	Pearson Correlation	0.007	-0.021	.199*	-0.009	-0.001	0.076	-0.034	-0.045	0.058	-0.047	-0.047	-0.007	-.136*	.840*	1	

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).

TABLE 2.2 PEARSON CORRELATION COEFFICIENTS OF WORKING CAPITAL MANAGEMENT AND PROFITABILITY MEASURES OF AUTO INDUSTRY

Variables		ROA	NOP	NPM	GPM	ROE	RCP	ICP	PP	CC	CATA	CLTA	DEBT RATIO	FIRM SIZE	CR	QR
ROA	Pearson Correlation	1														
NOP	Pearson Correlation	.824**	1													
NPM	Pearson Correlation	.571**	.608**	1												
GPM	Pearson Correlation	.382**	.439**	.894**	1											
ROE	Pearson Correlation	.405**	.468**	.264**	.132*	1										
RCP	Pearson Correlation	0.077	0.081	.598**	.722*	-0.074	1									

ICP	Pearson Correlation	-.202**	-.333**	0.012	.196*	-.210**	0.065	1								
PDP	Pearson Correlation	0.032	0.012	0.036	.211*	0.108	.220**	.402**	1							
CCC	Pearson Correlation	0.029	0.019	.590**	.720*	0.104	.959**	.238**	0.082	1						
CATA	Pearson Correlation	-.297**	0.008	.307**	.318*	0.096	.512**	0.036	-0.021	.525**	1					
CLTA	Pearson Correlation	-.349**	0.001	.225**	.208*	0.058	.308**	-.146*	0.008	.265**	.874**	1				
DEBT RATIO	Pearson Correlation	-.693**	-.307**	-.202**	0.089	.193**	0.016	0.076	0.079	0.017	.503**	.670*	1			
FIRM SIZE	Pearson Correlation	.310**	.379**	0.095	0.038	.547**	-.258**	-.183**	0.066	-.290**	.183**	0.015	-.156*	1		
CR	Pearson Correlation	0.057	0.204**	0.094	0.069	0.099	0.012	.215**	-.176**	0.009	0.008	-.150*	0.104	-.032	1	
QR	Pearson Correlation	0.016	0.291**	0.032	0.013	.129*	0.008	0.123	-.304**	0.117	0.009	-.178*	0.066	-.225*	.766*	1

** . Correlation is significant at the 0.01 level (2-tailed).
 * . Correlation is significant at the 0.05 level (2-tailed).

TABLE 3.1.1 REGRESSION ANALYSIS BETWEEN WCMM AND ROA FOR TEXTILE INDUSTRY

WCMM	Dependent Variable: Return on Assets											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	Coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.
RCP (in days)	-2.40E-05	0.500	-	-	-	-	-	-	-	-	-	-
ICP (in days)	-	-	1.76E-05	0.610	-	-	-	-	-	-	-	-
PDP (in days)	-	-	-	-	0.00	0.58	-	-	-	-	-	-
CCC (in days)	-	-	-	-	-	-	2.14E-06	0.801	-	-	-	-
CATA	-	-	-	-	-	-	-	-	-0.010	0.5493	-	-
CLTA	-	-	-	-	-	-	-	-	-	-	0.00	0.98
Debt Ratio	-0.0061	0.008	-0.0060	0.008	-0.01	0.01	-0.0060	0.010	-0.010	0.0081	-0.01	0.011
Firm Size	-0.0056	0.762	-0.0056	0.761	-0.01	0.69	-0.0054	0.782	-0.010	0.7833	0.00	0.84
CR	0.02617	0.024	0.0255	0.028	0.03	0.03	0.02553	0.030	0.026	0.0257	0.03	0.033
QR	-0.0056	0.401	-0.0060	0.368	-0.01	0.36	-0.0062	0.362	-0.010	0.3559	-0.01	0.367
R2	0.0260		0.0256		0.03		0.02525		0.026		0.03	
Durbin-Watson	1.8962		1.8900		1.89		1.89161		1.893		1.89	
Model significance	2.6701	0.021	2.628	0.020	2.64	0.02	2.59015	0.025	2.651	0.023	2.58	0.023

(F-test)													
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TABLE 3.1.2 REGRESSION ANALYSIS BETWEEN WCMM AND NOP FOR TEXTILE INDUSTRY

WCMM	Dependent Variable: Net Operating Profitability											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.
RCP (in days)	-2.37E-05	0.483	-	-	-	-	-	-	-	-	-	-
ICP (in days)	-	-	-1.56E-05	0.6413	-	-	-	-	-	-	-	-
PDP (in days)	-	-	-	-	1.70E-07	0.9812	-	-	-	-	-	-
CCC (in days)	-	-	-	-	-	-	-2.80E-06	0.7285	-	-	-	-
CATA	-	-	-	-	-	-	-	-	0.0046	0.843	-	-
CLTA	-	-	-	-	-	-	-	-	-	-	0.0054	0.57
Debt Ratio	0.000216	0.921	0.000252	0.9077	0.00023	0.9182	0.000116	0.9578	0.0002	0.103	-0.0001	0.96
Firm Size	0.026244	0.136	0.026364	0.1384	0.02833	0.1342	0.030413	0.1014	0.0286	0.003	0.0295	0.09
CR	0.03296	0.003	0.03236	0.0035	0.03274	0.0033	0.033223	0.0029	0.0327	0.100	0.0329	0.00
QR	-0.01024	0.111	-0.01061	0.0973	-0.0106	0.0983	-0.01045	0.1031	-0.011	0.085	-0.0104	0.10
R2	0.020678		0.020138		0.01971		0.019948		0.0198		0.0203	
Durbin-Watson	2.001976		2.001228		1.99951		2.000306		1.9997		1.9996	
Model significance (F-test)	2.111443	0.063	2.055169	0.0697	1.99951	0.0757	2.035442	0.0723	2.0188	0.075	2.08	0.07

TABLE 3.1.3 REGRESSION ANALYSIS BETWEEN WCMM AND NPM FOR TEXTILE INDUSTRY

WCMM	Dependent Variable: Net Profit Margin											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.
RCP (in days)	-5.10E-04	0.180	-	-	-	-	-	-	-	-	-	-
ICP (in days)	-	0.183	-	-	-	-	-	-	-	-	-	-
PDP (in days)	-	-	8.63E-05	0.8205	-	-	-	-	-	-	-	-
CCC (in days)	-	-	-	-	7.35E-05	0.37	-	-	-	-	-	-
CATA	-	-	-	-	-	-	-1.04E-04	0.253	-	-	-	-
CLTA	-	-	-	-	-	-	-	-	0.2878	0.274	-	-
Debt Ratio	0.01691	0.492	0.017167	0.4863	0.01419	0.57	0.01294	0.603	0.0174	0.479	0.04508	0.68
Firm Size	0.49038	0.014	0.541248	0.0075	0.60728	0.008	0.615729	0.003	0.5590	0.005	0.01432	0.58

CR	0.9819 4	0.0 00	0.9785 34	0.00 00	0.9909 4	0. 00	0.9957 21	0.0 00	0.9767 00	0.0 00	0.5430 3	0. 01
QR	0.0341 3	0.6 38	0.0264 33	0.71 53	0.0292 1	0. 69	0.0317 92	0.6 61	0.0300 61	0.6 78	0.9780 1	0. 00
R2	0.1502 4		0.1532 7		0.1367 8		0.0728 4		0.0665		0.0280 3	
Durbin-Watson	1.5112 7		0.1473 06		0.1486 0		0.1494 4		0.1493		0.1475 1	
Model significance (F test)	17.680 7	0.0 00	1.4958 51	0.00 00	1.4935 0	0. 00	1.4962 47	0.0 00	1.4995	0.0 00	1.4959 4	0. 00

TABLE 3.1.4 REGRESSION ANALYSIS BETWEEN WCMM AND GPM FOR TEXTILE INDUSTRY

WCMM	Dependent Variable: Gross Profit Margin											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	coeffic ient	Sig.	coeffic ient	Sig.	coeffic ient	Si g.	coeffic ient	Sig.	coeffic ient	Sig.	coeffic ient	Si g.
RCP (in days)	- 6.70E- 04	0.1 39	-	-	-	-	-	-	-	-	-	-
ICP (in days)	-	-	8.53E- 04	0.464 1	-	-	-	-	-	-	-	-
PDP (in days)	-	-	-	-	2.84E- 04	0. 04	-	-	-	-	-	-
CCC (in days)	-	-	-	-	-	-	-	0.0 0003 4	0.0 11	-	-	-
CATA	-	-	-	-	-	-	-	-	0.3694	0.23 58	-	-
CLTA	-	-	-	-	-	-	-	-	-	-	0.0512 7	0. 69
Debt Ratio	0.0168 81	0.5 62	0.0174 25	0.549 8	0.0067 9	0. 82	4.40E- 03	0.8 81	0.0175	0.54 78	0.0139 8	0. 64
Firm Size	1.3057 76	0.0 00	1.3861 47	0.000 0	1.5662 9	0. 00	1.5589 54	0.0 00	1.3975	0.00 00	1.374	0. 00
CR	0.0555 09	0.7 06	0.0554 2	0.707 6	0.0881 1	0. 55	0.0970 38	0.5 11	0.0491	0.73 9	0.0502 7	0. 73
QR	0.0432 62	0.6 14	0.0311 99	0.715 8	0.0409 7	0. 63	0.0480 66	0.5 73	0.0378	0.65 89	0.0349 9	0. 68
R2	0.0683 07		0.0652 04		0.0718 2		0.0762 21		0.0668		0.0645	
Durbin-Watson	1.3105 34		1.3065 23		1.3086 5		1.3162 82		1.3067		1.3045 1	
Model significance (F test)	7.3168 35	1E- 06	6.9612 54	3.00E -06	7.7200	0. 00	8.2344 44	0.0 00	7.1477	2E- 06	6.88	0. 00

TABLE 3.1.5 REGRESSION ANALYSIS BETWEEN WCMM AND ROE FOR TEXTILE INDUSTRY

WCMM	Dependent Variable: Return on Equity											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	coeffic ient	Sig.	coeffic ient	Sig.	coeffic ient	Si g.	coeffic ient	Sig.	coeffic ient	Sig.	coeffic ient	Si g.
RCP (in days)	- 0.0001	0.5 25	--	-	-	-	-	-	-	-	-	-
ICP (in days)	-	-	0.0001	0.7 18	-	-	-	-	-	-	-	-
PDP (in days)	-	-	-	-	5.30E- 05	0. 41	-	-	-	-	-	-

CCC (in days)	-	-	-	-	-	-	-6.96E-05	0.337	-	-	-	-
CATA	-	-	-	-	-	-	-	-	0.0131	0.7179	-	-
CLTA	-	-	-	-	-	-	-	-	-	-	0.04903	0.57
Debt Ratio	-3.22E-03	0.869	-3.22E-03	0.86	-5.31E-03	0.79	-0.00598	0.762	-0.0030	0.8750	-0.0063	0.76
Firm Size	0.4787	0.003	0.5067	0.00	0.5490	0.00	5.51E-01	0.001	0.4955	0.0018	0.50696	0.00
CR	0.4794	0.000	0.4799	0.00	0.4877	0.00	0.490225	0.00	0.4774	0.000	0.47902	0.00
QR	-0.1270	0.028	-0.1300	0.02	-0.1284	0.03	-0.12687	0.028	-0.1300	0.0240	-0.12870	0.03
R2	0.0540		0.0530		0.0549		0.0554		0.0537		0.05433	
Durbin-Watson	0.8010		0.7980		0.8011		0.8034		0.7988		0.79783	
Model significance (F test)	5.7610	4E-05	5.7040	4E-05	5.82	0.00	5.7617	4E-05	5.6770	4E-05	5.7400	0.00

TABLE 3.2.1 REGRESSION ANALYSIS BETWEEN WCMM AND ROA FOR AUTO INDUSTRY

WCMM	Dependent Variable: Return on Assets											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.
RCP (in days)	0.0002	0.0014	-	-	-	-	-	-	-	-	-	-
ICP (in days)	-	-	-6.00E-04	0.0282	-	-	-	-	-	-	-	-
PDP (in days)	-	-	-	-	1.74E-05	0.95	-	-	-	-	-	-
CCC (in days)	-	-	-	-	-	-	2.00E-04	0.01	-	-	-	-
CATA	-	-	-	-	-	-	-	-	0.037	0.0403	-	-
CLTA	-	-	-	-	-	-	-	-	-	-	0.04396	0.02
Debt Ratio	-0.351	0.0000	-0.35	0.000	-0.35328	0.00	-0.352	0.00	-0.380	0.0000	-0.40610	0.00
Firm Size	0.081	0.0000	0.0592	0.0006	0.06682	0.00	0.079	0.00	0.071	0.0000	0.06183	0.00
CR	-0.016	0.2466	-0.007	0.6194	-0.01522	0.30	-0.018	0.22	-0.018	0.2092	-0.0158	0.27
QR	-0.011	0.5066	-0.02	0.2616	-0.01435	0.44	-0.014	0.42	-0.011	0.5012	-0.0100	0.57
R2	0.5579		0.5476		0.53811		0.551		0.546		0.54976	
Durbin-Watson	0.7751		0.7383		0.73517		0.763		0.763		0.78554	
Model significance (F test)	58.5659	0.00	56.167	0.00	54.06	0.00	57.01	0.00	55.897	0.00	56.66	0.00

TABLE 3.2.2 REGRESSION ANALYSIS BETWEEN WCMM AND NOP FOR AUTO INDUSTRY

WCMM	Dependent Variable: Net Operating Profitability											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.
RCP (in days)	0.000272	0.0027	-	-	-	-	-	-	-	-	-	-
ICP (in days)	-	-	-0.0014	0.00	-	-	-	-	-	-	-	-
PDP (in days)	-	-	-	-	-1.04E-03	0.01	-	-	-	-	-	-
CCC (in days)	-	-	-	-	-	-	2.36E-04	0.01	-	-	-	-
CATA	-	-	-	-	-	-	-	-	0.10369	0.0000	-	-
CLTA	-	-	-	-	-	-	-	-	-	-	0.14394	0.00
Debt Ratio	-0.1539	0.0000	-0.1475	0.00	-0.15293	0.00	-0.15499	0.00	-0.23277	0.00	-0.32970	0.00
Firm Size	0.128056	0.0000	0.09121	0.00	0.099673	0.00	0.126479	0.00	0.12315	0.00	0.09392	0.00
CR	-0.02151	0.2609	-0.0005	0.98	-0.01271	0.51	-0.02297	0.23	-0.02838	0.1323	-0.0222	0.22
QR	-0.04013	0.0831	-0.0566	0.013	-0.06477	0.01	-0.04321	0.06	-0.03605	0.1124	-0.0288	0.19
R2	0.294266		0.31834		0.289907		0.28696		0.32293		0.3769	
Durbin-Watson	0.707634		0.68182		0.660432		0.696223		0.67058		0.71292	
Model significance (F test)	19.34714	0.0000	21.6696	0.00	18.940	0.00	18.67353	0.00	22.1306	0.00	28.070	0.00

TABLE 3.2.3 REGRESSION ANALYSIS BETWEEN WCMM AND NPM FOR AUTO INDUSTRY

WCMM	Dependent Variable: Net Profit Margin											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.
RCP (in days)	0.000377	0.000	-	-	-	-	-	-	-	-	-	-
ICP (in days)	-	-	3.89E-05	0.7808	-	-	-	-	-	-	-	-
PDP (in days)	-	-	-	-	0.000149	0.34	-	-	-	-	-	-
CCC (in days)	-	-	-	-	-	-	0.000377	0.00	-	-	-	-
CATA	-	-	-	-	-	-	-	-	0.07546	0.0000	-	-
CLTA	-	-	-	-	-	-	-	-	-	-	0.07665	0.00
Debt Ratio	-0.03307	0.0009	-0.03727	0.0049	-3.76E-02	0.00	-0.03421	0.00	-0.09234	0.00	-0.1291	0.00
Firm Size	0.032983	0.0000	0.008114	0.3901	0.009033	0.33	0.034371	0.00	0.01736	0.0033	-0.0008	0.92
CR	0.007282	0.2275	0.009193	0.2648	0.008729	0.28	4.57E-03	0.45	0.00345	0.622	0.00844	0.22

QR	-3.12E-05	0.9966	-0.0054	0.5789	-	0.78	-	0.58	0.00022	0.979	0.00246	0.77
R2	0.462874		0.052435		0.055823		0.456061		0.28159		0.2921	
Durbin-Watson	0.770615		0.604727		0.624998		0.745552		0.72553		0.75581	
Model significance (F test)	39.98572	0.0000	2.567606	0.0277	2.74000	0.02	38.90371	0.00	18.18670	0.00	19.150	0.00

TABLE 3.2.4 REGRESSION ANALYSIS BETWEEN WCMM AND GPM FOR AUTO INDUSTRY

WCMM	Dependent Variable: Gross Profit Margin											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.
RCP (in days)	0.000664	0.000	-	-	-	-	-	-	-	-	-	-
ICP (in days)	-	-	6.08E-04	0.0051	-	-	-	-	-	-	-	-
PDP (in days)	-	-	-	-	0.000815	0.000	-	-	-	-	-	-
CCC (in days)	-	-	-	-	-	-	0.000671	0.000	-	-	-	-
CATA	-	-	-	-	-	-	-	-	0.09928	0.000	-	-
CLTA	-	-	-	-	-	-	-	-	-	-	0.09048	0.000
Debt Ratio	-0.02211	0.110	-0.03313	0.1025	-3.21E-02	0.11	-2.41E-02	0.08	-0.1019	0.000	-0.1378	0.000
Firm Size	0.028615	0.005	-0.00794	0.5851	-0.00823	0.57	0.03158	0.000	-0.0033	0.8072	-0.026	0.005
CR	0.014451	0.087	0.010285	0.4176	0.013268	0.28	0.009574	0.26	0.0105	0.3604	0.01724	0.14
QR	-8.32E-03	0.414	-0.01294	0.3882	-0.00234	0.88	-0.01542	0.13	-0.0105	0.4455	-0.0087	0.54
R2	0.557126		0.052947		0.066968		0.559968		0.18774		0.16128	
Durbin-Watson	0.564627		0.508576		0.551904		0.593057		0.59494		0.56308	
Model significance (F test)	58.37009	0.000	2.594068	0.0263	3.330	0.01	59.04682	0.000	10.7243	0.000	8.9200	0.000

TABLE 3.2.5 REGRESSION ANALYSIS BETWEEN WCMM AND ROE FOR AUTO INDUSTRY

WCMM	Dependent Variable: Return on Equity											
	Regression Model: Pooled ordinary least square											
	Reg. 1		Reg. 2		Reg. 3		Reg. 4		Reg. 5		Reg. 6	
	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.	coefficient	Sig.
RCP (in days)	0.003904	0.196	-	-	-	-	-	-	-	-	-	-
ICP (in days)	-	-	-1.61E-02	0.150	-	-	-	-	-	-	-	-
PDP (in days)	-	-	-	-	-0.01359	0.28	-	-	-	-	-	-

CCC (in days)	-	-	-	-	-	-	0.003569	0.24	-	-	-	-
CATA	-	-	-	-	-	-	-	-	1.2047	0.1357	-	-
CLTA	-	-	-	-	-	-	-	-	-	-	-0.0136	0.28
Debt Ratio	-2.22859	0.035	-2.16158	0.041	-2.21957	0.04	-2.24E+00	0.03	-3.1528	0.0092	-2.2196	0.04
Firm Size	7.422096	0.000	6.942733	0.000	7.028052	0.00	7.413005	0.00	7.31527	0.000	7.0281	0.00
CR	-1.54478	0.017	-1.29424	0.050	-1.42762	0.03	-1.56833	0.02	-1.6198	0.0123	-1.4276	0.03
QR	1.32E+00	0.088	1.119848	0.151	0.996949	0.22	1.280458	0.10	1.35995	0.0799	0.9969	0.22
R2	0.332459		0.333606		0.331002		0.003569	0.24	0.33405		0.3569	
Durbin-Watson	0.277645		0.269666		0.279302		0.279435		0.2682		0.2728	
Model significance (F test)	23.10881	0.000	23.22852	0.000	22.96	0.00	23.02027	0.00	23.2754	0.000	25.76	0.00