

Full Length Research Paper

Working capital management and firm's profitability in Pakistan: A disaggregated analysis

Zeeshan Khan*, Syed Tehseen Jawaid, Imtiaz Arif and Muhammad Nadeem Khan

Business Graduate, IQRA University Karachi-75300, Pakistan.

Accepted 21 November, 2011

This study investigates the effects of working capital management on firm's profitability in Pakistan by using average annual cross sectional data from 2004 to 2009. Four different sectors namely textile, chemical, engineering and sugar and allied are considered. Inventory turnover, average payment period, current ratio, firm size, average collection period and debit ratio are used. Regression results indicate that average collection period has insignificant effects on profitability except in sugar and allied sector. At the same time debit ratio also has insignificant effect on profitability except in engineering sector. Furthermore average payment period has insignificant effect only in sugar and allied sector. Inventory turnover, current ratio and firm size has significant effects on profitability in all sectors. Sensitivity analysis confirms that the results are robust.

Key words: Working capital, firm's profitability, cross section data, sensitivity.

INTRODUCTION

The working capital management has a direct relation with the firm's decision of creating balances between current assets and current liabilities. These decisions influence the efficiency and size of working capital. The assets which are convertible to cash within a period of one year without losing its value and any disturbance in business operation of a firm have considered current assets like cash, accounts receivable, inventory and marketable securities are the key components of current assets. At their inception, current liabilities are supposed to be paid in normal course of business within a period of one year. Accounts payable, bank overdraft, outstanding expenses and bills payable are main components of current liabilities. The choices for the arrangement of resources to make available sufficient level of current assets to meet firm's current obligations are basic concern for working capital management.

This process attracts the attention of management to make a balance between the existing position of current assets and current liabilities. In today's scenario rising cost of capital and scarce resources of fund needs special

emphasis for the availability of working capital. This is a general concern that policy and procedure for the management of working capital put the positive or negative impact on the profitability of a business entity. The reduction in the profitability of business concern ultimately leads towards the financial crisis which shows the inefficiency in working capital management.

The working capital management is considered as operating capital which is important for daily cash requirement of the organization and could not be retained in the business for long span of time in a particular form. The invested amounts in working capital keep changing its formation during the normal cycle of business operations. The inadequate level of working capital in any industry just as human body is unable to survive without the circulation of blood in the body; the business also requires sufficient flow of funds within the organization. If it goes down towards the weak level then the survival of a business will become difficult. In the developing countries like Pakistan, working capital starvation is generally accredited as key factor which is the reason of decline in the profitability of any industry.

A lot of work has been done on the topic of working capital management effects on firm's profitability in which operating cycle, firm's growth, return on assets, firm's

*Corresponding author. E-mail: Zeeshan.khan16@yahoo.com.

size, leverage, aggressive and conservative working capital policies, operating and capital expenditure in different firms has already been covered. The different sector's effect has also been analyzed. In the current scenario of Pakistan, there is an existing gap that still no work has been produced on the comparison for different industries that how working capital management effects on their profitability.

The focus of this research is to find out the effect of working capital management on profitability over a period of 6 years for 262 firms related to sugar and allied, engineering, chemical and textile sectors of Pakistan¹. The core objective is to explore the relationship and to check the sensitivity of working capital variables' profitability for measuring the performance of all firms to draw the conclusions for suggesting the measures of improvement for association between profitability and management of working capital component in mentioned sectors of Pakistan.

LITERATURE REVIEW

Most of the researchers studied the impact of optimum inventory management while other authors studied the management of accounts receivables in an optimum way that leads to profit maximization.

According to Deloof (2003) the way that working capital is managed has a significant impact on profitability of firms. This result indicates that there is a certain level of working capital requirements which potentially maximizes returns.

Rehman and Nasir (2007) explored the effect of working capital management on firms' liquidity as well as on profitability. The data used to examine the effect has been collected from the Karachi stock exchange (KSE) for listed companies and from the web sites of the subject companies. The period is restricted up to years 1999 to 2004. The sample of 94 companies from the different sectors of economy is used.

The Pearson's correlation and regression analysis used as statistical techniques in this paper. They work on the different variables of liquidity like, average payment period (APP), average collection period (ACP), cash conversion cycle (CCC), inventory turnover in days (ITID), and current ratio as independent variables and debit ratio, firms size (natural logarithm of sales) used as proxy and the net operating profit (NOP) used as dependent variable. The regression result is showing negative relationship of liquidity variables upon dependent variable.² They found that as the cash conversion cycle increases it will lead to the decline in profitability of those firms and the management should take preventive action to reduce this cycle up to possible limit for creating the positive value for the shareholders.

Talat and Nazir (2008) examine the relationship between aggressive/conservative policies for working capital management. The 17 different groups of public companies listed on Karachi stock exchange has been taken for the period of 1998 to 2003. Find out relation of firm's profitability with different approaches of working capital. The ordinary least square regression has been used as statistical technique. To check the degree of aggressiveness, aggressive investment policy (AIP), aggressive financing policy (AFP) calculated through the ratio of total current assets to total assets (TCA/TA) and average total current liabilities to total assets (TCL/TA) and then return on assets (ROA), return on equity (ROE), used as dependent variables to find out the accuracy of alternative policies. The result shows that there is a negative relationship between the aggressive working capital policy and profitability and it is suggested that this study will help for future research on this topic.

Rehman et al. (2010) explore that the working capital is playing a vital role in the manufacturing firms. The period of this research is from 1998 to 2007, to find out the performance of manufacturing firms in Pakistan. The data of 204 firms listed on the Karachi stock exchange has been used as panel data. The first Pearson correlation coefficient is calculated. The variables are used net operating profitability (NOP) used as the dependent variable and, average payment period (APP), average collection period (ACP), cash conversion cycle (CCC), inventory turnover in days (ITID), gross working capital turnover ratio (GWCTR), net trading cycle (NTC), current liabilities to total assets ratio (CLTAR), current assets to total assets ratio (CATAR), financial debt ratio (FDR), size of firm using log of sales (LOS), sales growth (SG), current ratio (CR) has been used as independent variables. The results show that inventory turnover, net trade cycle and cash conversion cycle have significant affect on firm performance. It is the common problem in the manufacturing firms that they face difficulties in credit collection and payment policies. The size of a company and the financial leverage has strong relation with the profitability. It is suggested that existing conservative policy of Pakistani firm's should be revised to make the liquidity condition better for manufacturing firms. Individual component of working capital should have effective policies. The efficient management of financing in current ratio should help to increase corporate profitability.

Weinraub and Visscher (Fall, 1998) explore relationship of working capital policies like aggressive and conservative working capital policy. The purpose of this study is to cover diversified industry for the period of 1984 and 1993; the quarterly data set for ten different industries has been taken on quarterly bases. The computer based data is use to obtain the final sample for companies ranging from 15 to 33 in each industry, with a total of 216. The variables are aggressive investment policy (AIP), aggressive financing policy (AFP), return on assets (ROA), return on equity (ROE), and average total current assets to total assets (TCA/TA) and Average Total

¹ All 262 firms are from different economic sector of Pakistan.

² The variables are not co related with profitability.

Current Liabilities to Total Assets (TCL/TA). One way ANOVA test was used to determine the significant difference of current asset to total asset ratio.³ HSD test was used to compare the industry on paired sample bases.⁴ The findings show that each industry has different policy to manage its working capital. Those companies having aggressive policy are different significantly with others but not with same stability and same extant. Interesting thing found that there is a significant negative correlation in between the liability and assets policies of the industry. Normally, it occurs when the aggressive working capital asset policies are followed by the conservative working capital policies.

Danuletiu (2010) explore the efficient ability for the management of working capital in Alba County. The sample financial statement for 20 companies has been taken from the period of 2004 to 2008. The Pearson correlation analysis technique have been applied to identify the effect of working capital variables on firm's profitability. Necessary working capital and net treasury also determines the working capital management indicators, days working capital (DWC), days sales outstanding (DSO), days payable outstanding (DPO), days inventory outstanding (DIO) and return on sales (RS), return on assets (ROA), return on equity (ROE) used as indicator of profitability. All variables and indicators are statically significant and the result explains the indicator of working capital management and firm's profitability has a weak negative linear correlation. Weak resulted connection explained the reason that the companies belong to different fields of activity.⁵

Falope and Ajilore (2009) empirically identify the effect of working capital management on corporate profitability of firms. Balance panel data of 50 Nigerian on financial firms has been used for the period of 1996 to 2005. The time series and cross sectional data were combined and estimated. The dependent variable is net operating profitability and inventory turnover in days, conversion cycle, average collection period, average payment period used the result shows the significant variation of working capital component in the large and small firms. It is suggested that firm's manager can increase shareholder values by efficient management of working capital for this purpose they may reduce accounts receivable days and inventory turnover days up to the reasonable level.

Garci a-Teruel and nez-Solano (2007) explored the impact of working capital management on firm's profitability for the sample of Spanish firms, which are small and medium-size. They used 8,872 small to medium-sized enterprises (SMEs) as panel to cover the period of 1996 to 2002. The univariate analysis⁶ and multivariate

analysis techniques⁷ have been used, variables return on assets (ROA), accounts receivable (AR), inventory (INV), accounts payable (AP), cash conversion cycle (CCC), sales growth (SGROW), liabilities (DEBT), GDP growth (GDPGR) are considered. The result shows a significant negative relationship of working capital variables with profitability of small firms. It is suggested that the reduced level of cash conversion cycle, number of days in accounts receivable and inventory turnover days can create value for SMEs.

Padachi (2006) explored that positive contribution for the creation of firm's value is possible if the working capital is organized in a well managed pattern. The paper can be used to check the trend of working capital and its impact on performance. The key independent variables are inventories days, accounts receivables days, accounts payable days and cash conversion cycle and the ROA (return on assets) used as dependent variable for measuring the profitability. The 58 small manufacturing firms were used as a sample and panel data for the period of 1998 to 2003 used for analysis. The regression analysis model has been used to check the significance. The result shows that high investment in inventories and receivable put negative impact on firm's profitability. The findings are also showing rising trend in short run components of working capital financing.

Lazaridis and Tryfonidis (2006) investigated out the relationship of corporate profitability with working capital management by using the financial statements, gathered from the ICAP SA database. The analysis uses stacked data of 524 total observations for 131 companies as sample those have listing on Athens stock exchange (ASE) covering the period of 2001 to 2004. Regression analysis technique has been used and the variables are CCC, ACP and APP, fixed debt ratios, gross operating profit were considered. The result shows there is statistical significance between working capital management and profitability. The profitability of a firm can increase by proper handling of (accounts receivables, accounts payables, inventory), cash conversion cycle and maintaining the reasonable level of every component.

Appuhami (2008) investigated the impact of working capital expenditure on firm's profitability. For this purpose listed companies on Thailand stock exchange were used as data source in this study. The Shulman and Cox's (1985) Net Liquidity Balance and Working Capital Requirement were used as proxy for developing multiple regression model for measurement of working capital. The panel data has been used to apply regression analysis of cross-sectional for testing hypothesis. The variables are capital expenditure (CAPEX), operating expenditure (OPEX), dependent variables are net liquidity requirement (NLB), working capital requirement (WCR) and the control variables are operating cash flow (OPCASH), growth (GRO), debit to equity (D/E). The

³ ANOVA is used to compare the means of more than two samples.

⁴ Tukey's HSD test is to use for post ANOVA pair-wise comparison in one-way ANOVA

⁵ Different industries have its own dynamics which impact firm's profitability in different ways.

⁶ Univariate analysis is the techniques which utilize only a single dependent variable

⁷ Multivariate methods give an optimal linear combination of dependent variables those satisfy specific statistical criteria

relationship of all variables has effect on working capital management. The association of these variables may vary due to financial environment, economic environment and business strategies. The result shows that capital expenditure has a significant impact on working capital and found that the control variable also has impact on working capital management, it is suggested that knowledge base management will provide help in growing situations those are associated with capital expenditure.

Zariyawati et al. (2009) investigated that working capital is always ignored in decisions related with financials of the companies since they have a strong relation in the investment of short term financing. A desirable level working capital always has a contribution in the creation of firm's value. The tradeoff between corporate profitability and liquidity components can be controlled by managers to reach reasonable level of working capital. The panel of 1628 firms for the period of 1996 to 2006, including 6 economic sectors listed on Bursa Malaysia was used in the study. Pooled OLS regression analysis technique has been used and the variables: firms profitability (OI), cash conversion cycle (CCC), current ratio (CR), debit ratio (DR), sales growth (SG), it shows a strong negative relationship between CCC and firm profitability. Results show that cash conversion cycle is negatively associated to the profitability. It suggests that manager should concern for reduction of CCC for the creation of shareholder wealth.⁸

Ganesan (Fall, 2007) explored the efficiency of working capital management in telecommunication equipment industry. This study has covered the period of 2001 to 2007 and 443 annual statements for 349 companies were used. The variables are days of payable outstanding (DPO), days in working capital (DWC), days inventory outstanding (DIO), days sales outstanding (DSO), cash conversion efficiency (CCE),⁹ income to sales ratio (IS), income to total assets ratio (IA), and current ratio (CR). The correlation of regression analysis and the NAOVA were used to find the result. Results describe the days in working capital has a negative relation with profitability and it does not significantly impact firm's profitability in telecommunication equipment industry. It is suggested that the industry should reduce inventory and getting more credit from supplier to improve efficiency of working capital management.

MODELING FRAMEWORK

The first two chapters of this study provide conceptual background about the related literature which has been used to make an understanding about the research and in this part of the research it will discuss that which

⁸ Shareholders' wealth is basically the shareholder claim against his shareholding in the firm.

⁹ Cash conversion efficiency refers to ability of a business convert its sales in to cash.

approach will be adopted in this study, the variables the source of data and how to develop the hypothesis by selection of statistical tools and creating models accordingly.

The quantitative research refers toward the method of data collection and information which analyzed and expressed in numbers. In other words we can say a quantitative research is the only approach which can give the objective truth, because it can produce information in numbers.¹⁰ This research is focusing on the working capital management effect on a firm's profitability for comparison of different economic sector. For the analysis of all variables in the study SPSS software was used. For quantitative analysis, regression analysis was used and sensitivity for the data of working capital and profitability variables checked.¹¹ The cross sectional data were used for regression analysis in this study.

Working capital management is the main functional area of financial management. However, a lot of factors have influences on the requirement of working capital for a firm. It may be that all these factors have different impact on different units and keep varying with time. Generally the components of working capital have similarity in all organizations. Net operating profitability (NOP) is used as dependent variable to measures profitability and average collection period (ACP), inventory turnover in days (ITID), average payment period (APP), used as independent variables and additionally the current ratio (CR) mainly apply to find out the ability of a firm to payout its short term liabilities and debit ratio (DR) for calculating leverage of firm divide total debt by total assets and the Firm size Natural Logarithm of sales, (LOS) use as proxy, ϵ used as error term.

$$NOP = \beta_0 + \beta_1 ACP + \beta_2 ITID + \beta_3 APP + \beta_5 CR + \beta_6 DR + \beta_7 LOS + \epsilon \quad (1)$$

The purpose of this study is to find out the relationship between working capital variables and their effects on the profitability measure and performance of the firm for comparison of different sector in the economy; here, it is a set hypothesis (H_0 and H_1).

H_0 : Working capital management has an insignificant effect on corporate profitability in different sectors of the economy in Pakistan.

H_1 : Working capital management has a significant effect on corporate profitability in different sectors of economy in Pakistan.

Karachi Stock Exchange (KSE) is the main source of data and the web sites of different companies. The six year data of listed firms on KSE has been taken for

¹⁰ Quantitative research produces the result of research in the form of numbers.

¹¹ Linear Regression is the estimator for the coefficients of the linear equation, and has involvement of one and more than one independent variable to estimate of the dependent variable.

Table 1. Sample distribution for year 2004 to 2009.

Economic sector	No. of firms
Sugar and allied sector	62
Engineering sector	34
Chemical sector	32
Textile Sector	134
Total	262

Table 2. Regression analysis for textile sector for 134 firms.

Variable	Coefficient	t-statistic	P-value
C	-557.218	-3.977	0.000
ACP	-6.735	-1.231	0.221
ITID	-27.638	-2.798	0.006
APP	21.181	2.465	0.015
CR	115.184	2.134	0.035
DR	-115.64	-1.220	0.225
LOS	280.684	5.730	0.000
R square		0.276	
F- statistics		8.083	
Probability (F-statistics)		0.000	

Source: Author's estimation.

calculation and the period covered from 2004 to 2009. The sample consists of the financial statement of 262 firms listed on Karachi Stock exchange including firms from sugar and allied sector, engineering sector, chemical sector, textile sector in Pakistan (Table 1).

ESTIMATION AND RESULTS

The impact of working capital variable on net operating profitability has been analyzed with the help of a regression model on 4 different sectors of economy (Table 2).

The results of regression for textile sector showing that the regression coefficient of inventory turnover in days (ITID) is -27.638 with P-value of 0.006 that means it has a negative relation and is highly significant. It suggests that any increase in inventory turnover days will affect negatively on profitability of the sector. Average payment period (APP) is 21.181 with P-value (0.015) it shows a positive relation, has high significance, and implies that if the account payment period will increase it will affect positively on the profitability of the sector. Current ratio (CR) and Natural log of sales (LOS), used as control variable both shows positive relation with high significance meaning high current ratio will affect the profitability positively and similarly log of sales are taken as proxy for the size of the firm showing a significant positive relation with profitability; it means the big size of

Table 3. Regression analysis for engineering sector for 34 firms.

Variable	Coefficient	t-statistic	P-Value
C	-9.279	-6.116	0.000
ACP	-0.186	-0.794	0.434
ITID	-1.598	-3.05	0.005
APP	1.513	2.413	0.023
CR	1.224	2.599	0.015
DR	-1.824	-2.116	0.044
LOS	15.129	14.52	0.000
R square		0.932	
F- statistics		61.955	
Probability (F-statistics)		0.000	

Source: Author's estimation.

firms is more profitable than the smaller size. The average collection period (ACP) and debit ratio (DR) has a negative relation and showing no significance with the net operating profitability (NOP). Thus, these two variables can be dropped from the regression model.

The adjusted R^2 , also called the coefficient of multiple determinations, is the percentage of the variance in the dependent explained uniquely or jointly by the independent variables and it is 27.6%. The C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Here, C is -557.218; the probability of the coefficient is significant. The F statistic is used to test the significance of R. Overall, the model is significant as F-statistics is 8.083.

The results of regression for engineering sector (Table 3) show that the regression coefficient of inventory turnover in days (ITID) is -1.598 with P-value of 0.005; that means that it has a negative relation and is highly significant. It suggests that any increase in inventory turnover days put negative impact on profitability of the sector. Average payment period (APP) is 1.513 with P-value (0.023) it shows a positive relation and has high significance and implies that if the account payment period increase, it will affect the profitability of the sector positively and the debit ratio (DR) -1.824 with P-value of 0.044, it shows a significant negative relationship with the dependent variable, which means that, when leverage of the firm increases, it will adversely affect its profitability. The current ratio (CR) and natural log of sales (LOS) used as control variable shows positive relation with high significance, which means high current ratio will affect positively the profitability and similarly log of sales taken as proxy for the size of the firm showing a significant positive relation with profitability it means the big size of firms is more profitable then the smaller size. The average collection period (ACP) and debit ratio (DR) has negative relation and showing no significance with the net operating profitability (NOP). Thus, these two variables

Table 4. Regression analysis for chemical sector for 32 firms.

Variable	Coefficient	t-statistic	P-value
C	-3884.604	-2.662	0.013
ACP	-53.934	-0.895	0.379
ITID	-273.791	-4.306	0.000
APP	234.444	3.502	0.002
CR	1477.018	3.101	0.005
DR	-319.255	-0.494	0.626
LOS	1272.942	2.693	0.012
R square		0.666	
F- statistics		8.30	
Probability (F-statistics)		0.000	

Source: Author's estimation

can be dropped from the regression model.

The adjusted R^2 , also called the coefficient of multiple determinations, is the percentage of the variance in the dependent explained uniquely or jointly by the independent variables and is 93.2%. C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Here, C is -9.279; the probability of the coefficient is significant. The F statistic is used to test the significance of R. Overall, the model is significant as F-statistics is 61.95.

The results of regression for chemical sector (Table 4) show that the regression coefficient of Inventory turnover in days (ITID) is -273.79 with P-value of 0.000, which means it has a negative relation and is highly significant. It suggests that any increase in inventory turnover days will affect negatively to profitability of the sector. Average payment period (APP) is 234.44 with P-value (0.002); it shows a positive relation and has high significance and implies that if the account payment period will increase, it will affect positively the profitability of the sector. Current ratio (CR) and natural log of sales (LOS) use as control variable both are showing positive relation with high significance means high current ratio will affect positively to the profitability and similarly log of sales taken as proxy for the size of the firm showing a significant positive relation with profitability it means the big size of firms is more profitable than the smaller size. The average collection period (ACP) and debit ratio (DR) has negative relation and showing no significance with the net operating profitability (NOP). Thus, these two variables can be dropped from the regression model.

The adjusted R^2 , also called the coefficient of multiple determinations, is the percentage of the variance in the dependent explained uniquely or jointly by the independent variables and is 66.60%. C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Here, C is -3884.604; the probability

Table 5. Regression analysis for allied and sugar sector for 62 firms.

Variable	Coefficient	t-statistic	P-value
C	-410.878	-4.536	0.000
ACP	9.942	2.485	0.016
ITID	-14.304	-2.946	0.005
APP	4.356	1.033	0.306
CR	57.961	2.628	0.011
DR	32.187	1.663	0.102
LOS	172.728	4.093	0.000
R square		0.441	
F- statistics		7.218	
Probability (F-statistics)		0.000	

Source: Author's estimation.

of the coefficient is significant. The F statistic is used to test the significance of R. Overall, the model is significant as F-statistics is 8.30.

The results of regression for the allied and sugar sector (Table 5) show that the regression coefficient of accounts receivable (ACP) is 9.942 with P-value of 0.016 is positive and significant. It implies that the increase in number of days in accounts receivable will significantly affect profitability of the sector. Inventory turnover in days (ITID) is -14.304 with P-value of 0.005, which means it has a negative relation and is highly significant. It suggests that any increase in inventory turnover days will affect negatively to profitability of the sector. Current ratio (CR) and natural log of sales (LOS) used as control variable both showing positive relation with high significance means high current ratio will affect positively to the profitability and similarly log of sales taken as proxy for the size of the firm showing a significant positive relation with profitability it means the big size of firms is more profitable than the smaller size. The average payment period (APP) and debit ratio (DR) has negative relation and shows no significance with the net operating profitability (NOP). Thus, these two variables can be dropped from the regression model.

The adjusted R^2 , also called the coefficient of multiple determinations, is the percentage of the variance in the dependent explained uniquely or jointly by the independent variables and is 44.10%. C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Here, C is -410.878; the probability of the coefficient is significant. The F statistic is used to test the significance of R. Overall, the model is significant as F-statistics is 7.218.

SENSITIVITY ANALYSIS

Here, sensitivity analysis has to be performed to test the

Table 6. Results of sensitivity analysis.

Variable	Constant	ACP	ITID	APP	CR	DR	LOS	R Square	F-statistics (prob.)
Textile sector									
Base model 134 firms									
Coefficients	-557.218	-6.735	-27.638	21.181	115.184	-115.64	280.684	0.276	8.083 (0.000)
t-stat	-3.977	-1.231	-2.798	2.465	2.134	-1.22	5.73		
Probability	0.000	0.221	0.006	0.015	0.035	0.225	0.000		
1 Model 130 firms									
Coefficients	-643.337	-5.775	-29.112	20.459	118.957	-111.614	319.885	0.305	8.992 (0.000)
t-stat	-4.359	-1.057	-2.929	2.352	2.206	-1.178	6.075		
Probability	0.000	0.293	0.004	0.020	0.029	0.241	0.000		
2 Model 120 firms									
Coefficients	-433.326	-2.378	-24.385	16.775	93.513	-144.311	239.91	0.304	8.227 (0.000)
t-stat	-3.253	-0.548	-3.018	2.417	1.986	-1.592	5.167		
Probability	0.002	0.584	0.003	0.017	0.049	0.114	0.000		
Engineering sector									
Base model 34 firms									
Coefficients	-9.279	-0.186	-1.598	1.513	1.224	-1.824	15.129	0.932	61.95 (0.000)
t-stat	-6.116	-0.794	-3.05	2.413	2.599	-2.116	14.52		
Probability	0.000	0.434	0.005	0.023	0.015	0.044	0.000		
1 Model 32 firms									
Coefficients	-11.674	-0.119	-1.091	1.527	1.293	-2.515	16.359	0.936	61.06 (0.000)
t-stat	-7.258	-0.542	-1.881	2.492	2.97	-3.009	15.089		
Probability	0.000	0.592	0.072	0.020	0.006	0.006	0.000		
2 Model 28 firms									
Coefficients	-12.041	-0.165	-1.04	1.672	1.389	-2.439	16.415	0.943	57.73 (0.000)
t-stat	-6.863	-0.702	-1.79	2.582	3.191	-2.991	13.418		
Probability	0.000	0.491	0.088	0.017	0.004	0.007	0.000		
Chemical sector									
Base model 32 firms									
Coefficients	-3884.6	-53.934	-273.79	234.444	1477.01	-319.25	1272.94	0.666	8.30 (0.000)
t-stat	-2.662	-0.895	-4.306	3.502	3.101	-0.494	2.693		
Probability	0.013	0.379	0.000	0.002	0.005	0.626	0.012		
1 model 28 firms									
Coefficients	-4049.42	-44.202	-280.32	238.636	1557.35	-320.64	1301.02	0.667	7.319 (0.000)
t-stat	-2.552	-0.642	-3.962	3.318	2.753	-0.445	2.326		
Probability	0.019	0.528	0.001	0.003	0.012	0.661	0.030		
2 Model 25 firms									
Coefficients	-4561.07	-9.136	-302.38	244.243	1632.91	-398.72	1478.056	0.695	6.844 (0.000)
t-stat	-2.132	-0.085	-3.791	2.927	2.516	-0.52	2.238		
Probability	0.047	0.933	0.001	0.009	0.022	0.610	0.038		
Sugar and allied Sector									
Base model 62 firms									

Table 6. Contd.

Coefficients	-410.878	9.942	-14.304	4.356	57.961	32.187	172.728		
t-stat	-4.536	2.485	-2.946	1.033	2.628	1.663	4.093	0.441	7.218 (0.000)
Probability	0.000	0.016	0.005	0.306	0.011	0.102	0.000		
1 Model 60 firms									
Coefficients	-397.063	9.783	-14.362	4.954	66.588	31.614	162.36		
t-stat	-4.29	2.421	-2.911	1.135	2.761	1.616	3.688	0.445	7.074 (0.000)
Probability	0.000	0.019	0.005	0.262	0.008	0.112	0.001		
2 Model 50 firms									
Coefficients	-492.114	11.275	-15.011	6.706	62.882	30.146	198.722		
t-stat	-4.448	2.58	-2.597	1.309	2.244	1.262	4.000	0.471	6.368 (0.000)
Probability	0.000	0.013	0.013	0.198	0.03	0.214	0.000		

Source: Author's estimation.

robustness of the results. Levine and Renelt (1992) established the degree of confidence among the relation between the dependent and independent variables. By putting the different number of observation in the model if coefficient of explanatory variable remain significant and of the same sign then they refer to the result as robust. If the coefficient does not remain significant or if the coefficient changes sign, then the confidence in the relationship between variables is less and they refer to the result as fragile.

In the core model of this study average, collection period (ACP), inventory turnover in days (ITID), average payment period (APP) are major determinants of working capital. Table 6 reports the results of sensitivity analysis, where we have shown the impact of working capital variable on profitability with the different level of observation in the basic model. It is clear from Table 6 that despite checking at different level of observation, the coefficient of the focus variables remain the same, no matter the combination of observation (Levine and Renelt, 1992) used in the basic model. Thus, our result supports a robust positive relationship between working capital variables and firm's profitability in Pakistan.

CONCLUSION AND IMPLICATION

The conclusions of previous studies are in conformation with Deloof (2003); Eljelly (2004), Shin and Soenan (1998); they found a strong negative relationship between the variables of working capital management including the average collection period, inventory turnover in days, average payment period with corporate profitability. While reviewing theoretical literature or previous empirical studies the relationship between working capital and profitability remains more or less similar. This study intends to contribute to the existing literature using the cross section data of four different economic sectors of

Pakistan for the comparison of working capital variable's effect on profitability of sectors. The results of regression analysis show that every sector has its own dynamics because working capital variables react different with profitability in each sector. The sensitivity analysis confirms that the results are robust. The efficient management of working capital has importance and it is indisputable. Furthermore, sufficient level of working capital has an essential impact on net operating profitability and liquidity of firm. The policy implication of this study is that average collection period of textile, engineering and chemical sectors need more emphasis and average payment period of allied and sugar sector need more consideration. On the basis of the preceding elaborated analysis, it may be further concluded that these results can be more strengthened if the sectors manage their working capital in a more efficient manner. Management of working capital refers to the "management of current assets and current liabilities, and financing these current assets". If these firms manage their cash, accounts receivables and inventories in a proper way, this will ultimately increase profitability of these companies.

REFERENCES

- Appuhami BR (2008). The Impact of Firms' Capital Expenditure on Working Capital Management: An Empirical Study across Industries in Thailand. *Int. Manage. Rev.*, 4(1): 9-21.
- Danuletiu AE (2010). Working Capital Management and profitability: A case of Alba County companies. *Annales. Uni. Apu. Series. Oeconomica*, 2(1): 364-374.
- Falope OI, Ajilore OT (2009). Working Capital Management and Corporate Profitability Evidence from Panel Data Analysis of Selected Quoted Companies in Nijeria. *Res. J. Bus. Manage.*, 3 (11):1819-1932.
- Ganesan V (2007). An Analysis of Working capital Management Efficiency in Telecommunication Equipment Industry. *Rivier Acad. J.*, 3(2): 1-10.
- Garci a-Teruel, P.J, nez-Solano, P. M (2007). Effects of working capital management on SME profitability. *Int. J. Manag. Financ.*, 3 (2): 164-17.

- Lazaridis DL, Tryfonidis MD (2006). The relationship between working capital management and profitability of listed companies in the Athens Stock Exchange. *J. Financ. Manage. Anal.*, 19 (1): 1-12.
- Levine R, Renelt D (1992). A Sensitivity analysis of cross-country Growth Regression. *The Amr. Econ. Rev.*, 4 (21): 942-963.
- Padachi K, (2006). Trends in Working Capital Management and its Impact on Firms' Performance: An Analysis of Mauritian Small Manufacturing Firms. *Int. Rev. Bus. Res. Papers*, 2(13): 45-58.
- Rehman A, Nasir M (2007). Working Capital Management and Profitability-Case of Pakistani Firms. *Pak. J. Comm. Soc. Sci.*, 1(11): 25-36.
- Rehman A, Afza T, Qayyum A, Bodla A M (2010). Working Capital Management and Corporate Performance of Manufacturing Sector in Pakistan. *Int. Res. J. Financ. Econ.*, 47(12): 151-163.
- Talat D A, Nazir M S (2008). Working Capital Approaches and Firm's Returns in Pakistan. *Pak. J. Comm. Soc. Scie.*, 1 (11): 25-36.
- Weinraub H J, Visscher S (1998). Industry Practice Relating to Aggressive and Conservative Working Capital Policies. *J. Fin. Strategic Decis.*, 11 (7): 11-18.
- Zariyawati M, Annuar M, Taufiq H, Rahim A A (2009). Working Capital Management and Corporate Performance: Case. Malaysia. *J. Modern Acc. Audit.*, 5 (7): 47-54.