DOES WORKING CAPITAL MANAGEMENT AFFECT CORPORATE PROFITABILITY?

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Abstract. Managing working capital efficiently and effectively is critical for modern organizations as it directly affects firm's profitability, liquidity and riskiness. A vast majority of empirical studies have focused on developed countries whereas in case of developing countries like Pakistan it is somewhat under researched. The economy of Pakistan is passing through challenging times with rising inflation, energy crisis, poor law and order etc. Therefore, the purpose of the study was to investigate whether working capital policies adopted by listed organizations within the sugar industry of Pakistan (PSX) are efficient or not in these challenging conditions and what kind of effect (positive or negative) they have on the profitability of the firm. Data from 2006 to 2015 was collected for this study and Ordinary Least Squares (OLS) technique was used to analyse the effect of working capital management on firm profitability. Empirical results of the study show that all four components of working capital used in this study have statistically significant and negative relationship with firm's profitability.

Keywords: Working capital, cash conversion cycle, profitability.

Introduction

Working capital management is concerned with the administration of current assets and current liabilities in an efficient manner. Majority of manufacturing firms invest a significant proportion of their funds in working capital. Managing working capital in an efficient manner is critical in creating value for the shareholders as it affects firm's profitability and liquidity. Therefore, the adopted strategy of working capital is bound to have significant effect on firm profitability, risk and liquidity. Due to this reason for many firms it is an important part of their financial decision making and its importance cannot be ignored in the context of its influence on corporation's profitability, risk and liquidity. From a firm's perspective, working capital is vital for a number of reasons. For instance, current assets of a normal manufacturing

company constitute about 50% of its total assets and this proportion is even higher in distribution firms. Excessive levels of investment in current assets may result in lower profitability whereas lower level of currents assets may result in lower liquidity (Horne & Wachowicz, 2006).

Generally, in many organizations working capital is an important fragment of the company's corporate plan. The main objective of any business organization is to maximize the wealth of its shareholders. But ensuring liquidity is equally important for the firm. Increasing profitability at the expense of liquidity can have serious repercussions for the firm. Therefore, it is important that management strike a balance between these two important objectives of the firm to ensure long-term survival of firm (Singhania, Sharma & Rohit, 2014). Liquidity and profitability are equally important; the achievement of one objective should not be at the cost of the other. Due to these reasons working capital decisions are not easy decisions as they involve a lot of complexities and managers strive to find the optimal mix that will provide a balance between liquidity and profitability.

In the financial literature we find several arguments that help us understand the nature of relationship between working capital management and firm performance. On one hand, we find that investment in working capital results is positive effects on firm performance because investment in working capital allows firm to grow gradually by increasing its sales and earnings. Holding large inventories are helpful in reducing supply cost, minimizing loss in sales due to probable stock-outs situations and also provide a good hedge against increase prices of inputs (Blinder & Maccini, 1991; Corsten & Gruen, 2004; Fazzari & Petersen, 1993; Shah & Khan, 2012). Allowing credit sales may also increase firm's earnings as it allows for price discrimination and strengthens the long-term relationship between the firm and its customers (Summers & Wilson, 2002). On the other hand, shareholders value can be adversely affected if over investment is done in working capital. The reason being, additional financing may be needed for further investments which may in turn lead to increase in financing costs as well as opportunity costs. (Kieschnick, Laplante, & Moussawi, 2013). Hence, ceteris paribus, firms that maintain a higher proportion of working capital on their respective balance sheet also are exposed to bankruptcy risk and higher interest expenses. Furthermore, too much capital tied up in working capital may also hamper firm's ability to implement positive NPV projects in the short-run (Ek, & Guerin, 2011).

The main purpose of this paper is to analyse the relationship and impact of working capital on corporate profitability in the sugar industry of Pakistan. Managing working capital efficiently and effectively is critical for modern organizations as it directly affects firm's profitability, liquidity and riskiness.

For this particular reason most of the managerial time is dedicated towards managing working capital decisions. The purpose here is to investigate whether working capital policies adopted by organizations within the sugar industry of Pakistan are efficient or not and what kind of effect (positive or negative) they have on the profitability of the firm. A vast majority of empirical studies have focused on developed countries whereas in case of developing countries like Pakistan it is somewhat under researched. Pakistan is a developing country where inflation is comparatively high and is one of the main contributors to rising production costs of the firms. Currently the economy of Pakistan is facing many challenges including energy crisis, poor law and order situation which have significantly affected the business organization. Hence, in the presence of such challenging conditions for business firms it will be interesting to see how components of working capital influence corporate profitability in the sugar industry of Pakistan.

Literature Review

In the financial literature many studies have attempted both in developed and developing countries to study the relationship between working capital management and firm performance. The findings of these studies revealed that there are a number of aspects that have a profound effect on the working capital requirements of the firm. These factors include the nature of the business, market demand and supply conditions, credit policy, price changes due to inflation, availability of credit from suppliers etc. (Deloof, 2003; Ganesan, 2007; Shin & Soenen, 1998). It is important to highlight that these factors change for a firm over a period of time and further researches in this area will help us in providing more meaningful insights into the area under investigation.

In a study conducted on Thai manufacturing firms by Samiloglu and Demirgunes (2008), revealed an inverse association between gross operating profits and inventory turnover period, accounts receivable turnover period and cash conversion period. Kamath (1989) while analysing working capital practices in retailing firms also found an inverse relationship between profitability and cash conversion cycle. In another study Shin and Soenen (1998) identified a statistically negative association between earnings and cash conversion cycle while analysing a sample of American manufacturing firms for the period of 1974-1995. Results from this study indicate that shareholders wealth can be maximized by managers if cash conversion cycle is reduced to a reasonable level. Deloof (2003) hinted at possible association between earnings and cash conversion cycle. The findings of the study revealed that a rise in cash conversion cycle would lead to decline in firm's profits. According to the results of the study conducted by Lazaridis and Tryfondis (2006) cash

conversion cycle affects profitability negatively. Whereas a study involving listed cement firms of Pakistan, Zaman, Haq, Sohail and Alam (2011) confirmed moderate influence of working capital on firm profitability.

Deloof (2003) while analysing working capital effects on company's profitability found out that there is an inverse association between inventory turnover period, debtors collection period and profitability whereas creditors settlement period is positively correlated with profitability. Moreover studies by Wang (2002) analysing a sample of Taiwanese and Japanese firms; Afza and Nazir (2007) analysing a sample of KSE listed firms; and Abuzayed (2012) analysing a sample of firms listed on the Amman Stock Exchange, found that firm performance increases with the shortening the cash conversion cycle.

Similarly, Ganesan (2007) argued that firm can realize maximum possible revenues if the firm optimizes the balance between working capital components. Additionally, firm's free cash flow enhances with efficient management of working capital which creates opportunities for firms to grow and maximize their returns. Therefore, in order to maximize their value, an optimum level of working capital must be maintained by the firms (Afza & Nazir, 2007). Managing working capital in an efficient manner would likely result in yielding significant outcomes whereas its neglect can be significantly damaging for the firm (Christopher & Kamalavalli, 2009). Present literature provides ample evidence in terms of significance of working capital management. Eljelly (2004) argue that in order avoid the risk of insolvency working capital should be managed in an efficient and effective manner. Siddique and Khan (2009) indicated profitability diminishes with inefficient management of working capital which may ultimately lead to the stage of insolvency. Therefore, every firm, regardless of its size, profitability and business nature, needs to have sufficient quantity of investment in working capital. Consequently, efficient management of working capital is essential to ensuring the survival, liquidity and profitability of the firm and the approach used to manage working capital has enormous influence on the firm's performance.

Methodology

Since the objective of the study was to analyse the influence of working capital management on corporate profitability, Ordinary Least Squares (OLS) technique was used for data analysis. OLS technique is based on number assumptions such as there is no multicollinearity among explanatory variables; the variances of error term are normally distributed. Secondary data was used in this study from 2006 to 2015. Data was collected from the balance sheet analysis of listed firms available on State Bank's database. The reason for restricting data analysis to the last ten years was that complete information

required for this study was not available for all companies before 2006. Currently there are 36 sugar firms listed on Pakistan Stock Exchange (PSX). For data analysis, data was collected for only those firms that remained listed throughout the period of study. The final sample comprised of thirty one companies.

Estimated Model

Model 1

Model used to test the effect of debtor's collection period on return on assets

$$ROA_{it} = \alpha + \beta_1 DCP_{it} + \beta_2\,CR_{it} + \beta_3 DR_{it} + \beta_4\,FS_{it} + \beta_5\,GS_{it} + \epsilon_{it}$$

Model 2

Model used to test the effect of inventory turnover period on return on assets

$$\mathbf{ROA_{it} = \alpha + \beta_1 ITP_{it} + \beta_2\,CR_{it} + \beta_3 DR_{it} + \beta_4\,FS_{it} + \beta_5\,GS_{it} + \epsilon_{it}}$$

Model 3

Model used to test the effect of creditor's settlement period on return on assets.

$$ROA_{it} = \alpha + \beta_1 CSP_{it} + \beta_2\,CR_{it} + \beta_3 DR_{it} + \beta_4\,FS_{it} + \beta_5\,GS_{it} + \epsilon_{it}$$

Model 4

Model used to test the effect of cash conversion cycle on return on assets.

$$ROA_{it} = \alpha + \beta_1 CCC_{it} + \beta_2\,CR_{it} + \beta_3 DR_{it} + \beta_4\,FS_{it} + \beta_5\,GS_{it} + \epsilon_{it}$$

Measurement of Variables

Dependent variable

Return on Assets: In this study return on assets is used as a measure of corporate profitability. Return on assets is measured through profit before interest and taxation divided by total assets * 100

Independent Variables

a) *Debtors Collection Period (DCP)*

Debtors Collection Period determines the average number of days it takes a firm to receive its receivables resulting from credit sales. Debtors collection period is measured as trade debts divided by sales *365.

b) *Inventory Turnover Period (ITP)*

Inventory turnover period basically measures the number of days on average it takes to process raw materials into finished goods and then sell it to customers. It is measured as average inventory divided by cost of goods sold *365.

c) *Creditors Settlement Period (CSP)*

Creditors' settlement period measures the average of number of days it takes the organization to pay its suppliers for the material bought on credit basis. It is measured as creditors (accounts payable) divided by purchases * 365

d) *Cash Conversion Cycle (CCC)*

Cash Conversion cycle is the time between the purchase of raw material and the receivables of the sales of finished goods. It is measured as inventory turnover period + debtors collection period – creditors settlement period.

In addition, firm size (FS), debt ratio (DR), sales growth (GS), and current ratio (CR) are used as control variables. Firm size is measured as natural log of sales, sales growth is measured as current year sales minus last year's sales divided by last year's sales * 100, debt ratio is measured as total debt divided by total assets * 100 and current ratio is measured as current assets divided by current liabilities.

Skewness value for ROA was comparatively high which indicated that the data was not normally distributed. Since ensuring normal distribution is a pre-condition for regression analysis, hence log transformation was applied on ROA.

Results

Descriptive Statistics

Table 1 *Descriptive Statistics*

Variables	Mean	Standard Deviation	Observations
ROA	2.29	2.1	310
GS	15.92	20.78	310
FS	3.10	0.25	310
DR	3.23	2.35	310
CR	0.75	0.06	310
CSP	95.84	155.68	310
ITP	14.27	63.01	310
DCP	64.97	68.14	310

The above table show descriptive statistics of the variables. The mean value of return on assets is 2.29 whereas the standard deviation representing deviation from mean is 2.1. For Sales growth the mean and standard deviation are 15.92 and 20.78 respectively. For firm size (natural log of sales) mean and standard deviation values are 3.10 and 0.25 respectively. For debt ratio the mean and standard deviation is 3.23 and 2.35 respectively. As far as current ratio is concern which is a measure of liquidity, the standard deviation and mean values are 0.06 and 0.75 respectively. The mean and standard deviation values for creditor's settlement period are 95.84 and 155.68 respectively. For inventory turnover period the mean and standard deviation values are 14.27 and 63.01 respectively. Lastly, for debtor's collection period the mean and standard deviation values are 64.97 and 68.14 respectively.

Table 2   *Correlation Matrix*

	ROA	DCP	ITP	CSP	CCC	FS	DR	GS	CR
ROA	1.00								
DCP	-0.37**	1.00							
ITP	-0.34**	0.32**	1.00						
CSP	-0.45**	0.24**	0.24**	1.00					
CCC	-0.25**	0.56**	0.67**	-0.06	1.00				
FS	0.19	0.01	0.00	-0.01	0.05	1.00			
DR	-0.14	-0.12	-0.05	-0.04	-0.25	-0.00	1.00		
GS	0.297	-0.01	-0.17	-0.05	-0.06	0.102	-0.1	1.00	
CR	0.307**	-0.08	0.17	-0.18	0.06	0.043	-0.12	0.01	1.00

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

Regression Analysis

Regression analysis for Model 1

Table 3 *Effect of Debtor's Collection Period on Firm Profitability*

Variable	Coefficient	S.E	T-value	P-value	VIF
Constant	0.043	0.021	1.753	.081	
DCP	-0.004	0.001	-2.98	.012	1.443
FS	0.016	0.028	0.06	.734	1.51
CR	0.07	0.059	1.004	.631	1.39
DR	-0.489	0.0187	-2.99	.013	1.773
GS	0.448	0.381	1.235	.699	1.379
R-Square	0.224		*F-Stat*		4.564
P-value	0.001		*Durbin-Watson*		1.77

From the above table it is evident that there is an inverse relationship between debtor's collection period and return on assets. It means that rise in debtors collection period lowers profitability and vice versa. This negative relationship means that corporate profitability will be high in firms where debtor's collection period is smaller as compared to firms with higher debtor's collection period. Increase in debtors collection period delays the inflows that

are going to be used for re-investment, hence reduces profitability. At the same time, increase in debtor's collection period also increases the risk of default. The t-value of -2.98 indicates the relationship between debtor's collection period and firm profitability is statistically significant. R-square value of 0.222 indicates that 22.2% variation in the dependent variable (ROA) is caused by the independent variable. The value of VIF which is used as a measure for multicollinearity is less than 10 which indicates that multicollinearity is not an issue here. Empirically, studies from Deloof (2003), Nazir and Afza (2007) and Samiloglu and Demirgunes (2008) also indicate that there is a negative relationship between debtor's collection period and firm profitability.

Regression analysis for Model 2

Table 4 *Effect of Inventory Turnover Period on Firm Profitability*

	Coefficient	S.E	t-value	P-value	VIF
Constant	0.021	0.199	0.081	.453	
ITP	-0.003	0.001	-2.776	.011	1.301
FS	0.047	0.023	1.584	.812	1.368
CR	0.0799	0.069	1.121	.712	1.387
DR	-0.189	0.132	-1.453	.082	1.119
GS	0.467	0.412	1.109	.125	1.322
R-Square	0.221	Durbin-Watson	1.75		
F-Statistic	3.156	P-Value	.001		

Results from table 4 show that inventory turnover period is inversely correlated with firm profitability. Negative relationship here indicates that firms with a high inventory turnover period will experience lower profitability as compared to firms with lower inventory turnover period. The reason is that capital is tied up in working capital and if expected inflows are delayed then it increases the cash conversion cycle which results in lower profitability because the inflows received from the sale of product are re-invested in business for further earnings. The t-value of -2.776 indicates that the relationship between inventory turnover and firm profitability is statistically significant. R-square value of 0.221 indicates that 22.1% change in the dependent variable is caused by the independent variables. The value of VIF indicates that multicollinearity is not an issue here. Empirically, studies from Deloof (2003), Nazir and Afza

(2007), and Samiloglu and Demirgunes (2008) also indicate that there is a negative relationship between inventory turnover period and firm profitability.

Regression Analysis for Model 3

Table 5 *Effect of Creditor's Settlement Period on Firm Profitability*

	Coefficient	S.E	t-value	p-value	VIF
Constant	0.035	0.247	0.129	.327	
CSP	-0.007	0.003	2.900	.022	1.073
FS	0.043	0.031	1.390	.089	1.214
CR	-0.09	0.079	1.148	.091	1.233
DR	-0.25	0.143	-1.691	.231	1.209
GS	0.42	0.3215	1.254	.332	1.813
R-Square	.191	**Durbin-Watson**	1.66		
F-Statistic	2.51	**P-Value**	.012		

Results from Table 5 indicate that there is a negative relationship between creditor's settlement period and firm profitability. It reveals that firms earn more profits when they pay early as compared to firms who delay their payments. The reason behind this is that suppliers give discounts for paying them early. The t-value of 2.9002 indicates that the relationship between creditor's settlement period and firm profitability is statistically significant. R-square value of 0.191 indicates that 19.1% change in the dependent variable is caused by the independent variables. The value of VIF indicates that multicollinearity does not exist here. Empirically, evidence from Deloof (2003) and Samiloglu and Demirgunes (2008) also points towards a negative relationship between creditor's settlement period and firm profitability.

Regression Analysis for Model 4

Table 6 *Effect of Cash Conversion Cycle on Firm Profitability*

	Coefficient	S.E	t-value	p-value	VIF
Constant	0.0334	0.0271	0.861	.299	
CCC	-0.002	0.001	-2.531	.025	1.073
FS	0.059	0.043	1.391	.43	1.214
CR	0.089	0.063	1.402	.452	1.233
DR	0.041	0.156	0.262	.283	1.209
GS	0.388	0.249	1.537	.498	1.813
R-Square	.212	**Durbin-Watson**	1.79		
F-Statistic	2.72	**P-Value**	.013		

Results from Table 6 indicate that cash conversion cycle is inversely related to firm capital structure. Since cash conversion cycle relates to length of time to convert cash outflow into cash inflow, hence, profitability is expected to be lower for firms where cash conversion cycle is high as compared to companies where cash conversion cycle is low. The t-value of -2.531 indicates that there is a statistically significant relationship between cash conversion cycle and firm profitability. Empirical evidences from Afza and Nazir (2007), Lazaridis and Tryfonidis (2006), Singhania, et al., (2014) also suggest that there is a negative relationship between cash conversion cycle and firm profitability.

Conclusion

The aim of the paper was to find out whether working capital management policies adopted by the firm effect corporate profitability or not in the sugar sector of Pakistan. After detail analysis it was found out that there was negative relationship between the components of working capital and corporate profitability (return on assets). As the associated values of these components of working capital increase, corporate profitability decreases. Moreover, the relationship between the components of working capital management and firm profitability was statistically significant. However, the findings of this study are limited only to Sugar industry of Pakistan. Considering the importance of

efficient working capital management and its influence on corporate profitability and liquidity it is important to find out whether components of working capital management has similar effects in other industries also or not. The reason being organizations are different from each other and the nature of business which varies from one industry to another industry may provide meaningful insights into the relationship between components of working capital and corporate profitability.

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