Impact of Working Capital Management on Corporate Performance. A Study of Automobile, Chemical, Food, and Pharmaceutical Sector of Pakistan.

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Abstract: There is no hidden secret that working capital management policies do impact profitability but to what extent this is still a debatable issue. The capital structure theories suggest that apart from firm size, the sensitivity of working capital management policies varies among different business sectors. The present study aims to investigate variations in working capital policies of the Automobile, Chemical, Food, and Pharmaceutical sectors of Pakistan. Firm performance is measured through Return on Assets and Shareholders' wealth is measured through Return on Equity. We find that the chemical sector aggressively manages working capital with a mean value of a Net Trade Cycle is 21 days. The results also suggest that an aggressive working capital policy does not show any association with a firm's profitability while the opposite does hurt a firm's performance.

1.   Introduction:

The present study emphasizes the working capital practices of the Automobile, Chemical, Food, and Pharmaceutical sectors of the economy and their contribution to the profitability of the same as well. Working capital management proved to be an important area of corporate finance in the last decades especially its importance recognized in the era of the economic downturn 2007-08. Because of its growing importance in the world of corporate finance, the CFO Magazine publishes reports on working capital management performance in many countries. Investment in working capital always remains one of the important decisions that are taken by financial managers. For a long researchers have evolved several theories to help managers come out of this puzzle successfully. This decision is important as it has a direct impact on firm value. Haq et al. (2011) concluded that a firm's profitability is affected by the working capital policy adopted by the financial managers. Working capital in the simplest way can be defined as the ability of the company to meet its day-

to-day operations Charitou, Elfani, & Lois, (2010). The efficient management of working capital ensures not only the continuity in the operation of the business but also ensures to payment of short-term debt and upcoming operational expenses. It consists of the management of inventories, accounts receivables, accounts payable, and cash.

Numerous theories evolved to understand the relationship between working capital and firm performance. One school of thought argues that investment in working capital has a positive impact on firm performance. This is because this will allow firms to increase sales as well as get discounts by early payments. Excess investment in stock also gives shelter against price fluctuations, reduces order costs, and the possibility of reduced sales due to stock situation. On the other hand, overinvestment in stock increases financing costs. So eventually high interest cost leads to bankruptcy.

Corporate managers have three ways to deal with working capital namely Conservative, aggressive, and moderate policies of working capital management. Each one has a unique effect on a firm's profitability, liquidity, and risk. In a conservative approach, firms make excess investments in current assets so this approach is less risky and less profitable as well. In an aggressive approach, the firm made less investment in current assets. This approach increases the profitability and as well as risk as well. Moderate approaches manage the way between these two sides of the coin. In this approach firm tries to manage the permanent portion of the current portion with long-term funds while the rest of the portion of current assets with short-term financing.

It is important to note that working capital policies vary from organization to organization keeping given the nature of business. For instance, manufacturing industries have to maintain spare parts and equipment resulting in heavy investment in current assets. While services need not make heavy investments in current assets. In this context, it is implied that working capital policy significantly impacted shareholder value.

Financing constraints of an organization change the optimum level of working capital and its possible association with the profitability of the organization. This is not supported by the seminal work of Modigliani and Miller in which they claim that in a perfect capital market, firms are independent with financing and investment

decisions regarding its value. After that extensive literature on capital market imperfection evolved. Researchers concluded that market imperfection increases the cost of external financing as compared to internally generated funds. Fazzari et al. (1988) argue that several financial factors like availability of retained earnings, access to the capital market, and cost of financing affect a firm's investment in working capital. Fazzari and Petersen (1993) concluded that investment in working capital is more sensitive to financial constraints. To our knowledge, our paper is the first one to analyze the impact of financing constraints on this relationship. Based on the findings we concluded that managers put concentration on other areas of finance to increase shareholder value as working capital has the least impact on a firm's profitability. To the best of our knowledge, this is the first attempt to take the four diverse economic sectors simultaneously to analyze the possible impact of working capital management on a firm's profitability.

2. Literature Review:

Nadiri (1969) was among the pioneers who first studied the role of working capital management on profitability of the organizations. After that researchers evolve several approaches through keep using Nadiri's model.

There is extensive literature available on working capital approaches to risk and return the same Pinches, 1991; Brigham, and Ehrhardt, (2004); Gitman, (2005) and Moyer et al., (2005). Aggressive working capital policies associated with minimum investment in current assets. Resultantly characterized by high risk and high return characteristics. Conservative working capital policies are associated with huge investment in current assets as compared to aggressive policies hence, characteristics with low return and low risk Van Horne and Wachowicz, (2004).

Jose, Lancaster, and Stevens (1996) suggest that the cash conversion cycle is the most appropriate measure of working capital management. CCC measures the period between cash paid for acquiring inputs and cash received from regular sales (Knauer & Wohrmann). CCC is the period acquiring the inputs and then collection of cash from sale of goods Charitou et al., (2010); Deloof, (2003); Afza and Nazir (2009) claim that shorter the CCC leads to increase the profitability of the company.

Researchers claim that there is an inverted U-shaped relationship exists between firm performance and working capital management which means the optimal level of investment in current assets differs between firms according to the level of financial constraints they face. This U-shaped relationship exists because working capital is linked with profitability positively at a minimum level of working capital and inversely associated with a high level of working capital requirement. Modigliani and Miller (1958) claim that companies' availability of external finance is not a problem, especially in a frictionless world; hence investment does not depend on the availability of internal funds. In an imperfection market, external funds prove to be costly as compared to internal resources. Fazzari et al (1988) claim that firms placement of funds in current assets depends upon various financial factors like availability of internal finance, cost of external funds, and access to the financial market.

Filbeck and Krueger (2005) study the working capital management policies of 32 non-financial industries in the US to analyze the impact of the same on the profitability of the organization. They concluded that working capital policies significantly differ among industries over time. These policies also change from time to time among firms.

Shin and Soenen (1998) collected data from 58,985 firms from 1975 to 1994 to empirically test the possible association between the net trade cycle and profitability of sample firms. They conclude that there exists a strong association between the net trade cycle and profitability and suggest in order the increase profitability firms should reduce the net trade cycle.

Rehan and Nasir (2007) analyze the possible association between working capital and profitability by using the data of 94 Pakistani firms. They use CCC as a working capital measure to measure the impact of the same on firms profitably. They concluded that CCC is negatively associated with profit.

Ghosh and Maji (2003) empirically test the working capital management performance of the comment industry by using the data from 1992-1993 and 2001-2002. They calculated the indices instead of traditional working capital measures to analyze the efficiency of targeted firms. They found Indian Cement industry performance was not satisfactory during the studied period.

Gill et al. (2010) analyzed the impact of working capital management on a firm's profitability. They collect the data of 88 US firms from the period 2005 to 2007. They used a generalized least square regression model and concluded that there is a significant relationship between CCC and profitability.

Mohammad (2011) analyzed the relationship between profitability and working capital management in Iranian firms by using the data from 2001 to 2006. The cash conversion cycle is used as a measure of working capital efficiency. He concluded that the average collection period was inversely associated with profitability and inventory Turnover days were found significantly associated with profitability. They suggested that the firm should decrease the CCC to increase the firm profitability.

Mona (2012) studied the working capital policies (conservative, Aggressive) of Jordanian firms from the period 2001 to 2009. Conservative working capital policy, a relatively large investment in current assets, measuring current assets to total assets. He found by using a regressive method that a conservative working capital policy is positively associated with the profitability

and value of the firm. Aggressive working capital policy on the other hand is negatively associated with firm profitability and value.

Mosa et al. (2012) investigated the working capital management and profitability relationship of food companies in Tehran by collecting data from 2006 to 2011. They take debt rate and log sales as control variables and conclude the debt payment period. Inventory turnover and CCC are negatively associated with profitability. So managers should behave accordingly to enhance firms' value.

3. Methodology:

3.1. Sample

This study uses data from non-financial firms listed on the Pakistan Stock Exchange. The firm must meet the following acceptance criteria to be a part of the study i.e.

- Firms do not discontinue their business in any way during the study period.
- Firms should never delist during the study period.
- Firms having complete data of study period.

The data of sample firms was collected from their respective income statement and balance sheets.

Finally, as per selection criteria, 41 KSE-listed firms were selected which comprised 11 firms from the Automobile sector, 7 firms from the pharmaceutical sector, 15 firms from the chemical sector, and 8 firms from the food sector. We take financial statements of sample firms from their respective websites and data regarding the market price of shares collected from daily quotations of KSE.

3.2 Summary Statistics of Sample

[Insert table 3.1 here]

Table 3.1 describes descriptive statistics of 41 sample firms in the Automobile, Chemical, Foods, and Pharmaceutical sectors of Pakistan for the period from 2010 to 2015. In part A of the table we present Industry wise descriptive statistics. Results show that the Cash conversion cycle of the chemical sector is about 14 days while the mean value of the cash conversion cycle of the automobile, food, and pharmaceutical sectors are 37 days, 35 days, and 61 days respectively. The net trade cycle of the chemical sector is 21 days which is the lowest as compared to other sectors. The net trade cycle of the automobile, food, and

pharmaceutical sectors are 57 days, 30 days, and 76 days respectively. In the automobile sector, there is a difference between the net trade cycle and the cash conversion cycle. Results show that the net trade cycle of the automobile sector is about 20 days more compared to the Cash conversion cycle. Other sectors have almost the same net trade cycle and cash conversion cycle. Hence based on descriptive results we conclude that the chemical sector manages its working capital more efficiently as compared to other sectors of study. The average return on assets of sample firms is 12.48 % and the mean value of return on equity is 27.22%. The average net trade cycle of studied firms is 42 days and the average cash conversion cycle is 32 days

3.3 Variables of Study

[Insert table 3.2 here]

3.2.1. Dependent Variables

To quantify the role of working capital management on corporate profitability, we used Return on Equity (ROE), and Return on Asset (ROA) as dependent variables. Following Shin and Soenen (1998), Afza and Nazir (2008), Nazir and Afza (2009), and Rehman et al. (2010) in their seminal work used ROE as a measure of corporate

profitability. It depicts how efficiently a shareholder's investment is used to generate profit. On the other hand, there are several researchers like Jose et al. (1996), Wang (2002), and Garcia-Teruel and Martinez-Solano (2007) used return on asset (ROA) as a proxy to measure a firm's profitability.

3.2.2. Independent Variable

Net Trade Cycle (NTC) and Cash Conversion Cycle (CCC) were used as a variable to judge the working capital management efficiency of the sample firms. CCC is a widely used proxy to measure working capital management Deloof, (2003); Gill et al., (2010) It measures the period between cash outflow to acquire the resources and then eventually cash inflow by way of sales. Following Shin and Soenen NTC is an efficient proxy to measure the working capital management. So we used both widely used working capital management proxies to testify to the impact of both on profitability.

Following previous literature Firm size, liquidity, firms financial leverage, and growth opportunities were used as a control variable in the present study.

3.4 Correlation Analysis

[Insert table 3.3 here]

Table 3.3 presents the correlation results among the studied variables. Correlation measures how variables are associated with each other. Results show cash conversion cycles highly negatively correlated with return on equity and return on assets. Net Trade Cycle too negatively correlated with return on equity and return on equity. Firm size and Growth opportunities are positively associated with return on equity and return on assets. Liquidity and the Firm's financial leverage are negatively associated with return on assets and return on equity.

3.5 Models

OLS is a widely accepted technique used by the majority of researchers to empirically test the impact of working capital management policies on firms' profitability and shareholders' wealth maximization. (See for example; Deloof, (2003); Afza and Nazir (2009); and Lazaridis and Tryfonidis (2006). To analyze the impact of a firm's working capital policies on its profitability, we used the following model by applying panel data methodology.

$$ROA_{it}=\beta 0+\beta 1CCC_{it}+\beta 2FSQ_{it}+\beta 3LEV_{it}+\beta 4LIQ_{it}+\beta 5GRO_{it}+e_i\ldots\ldots\ldots\ldots\ldots(1)$$

$$ROA_{it}=\beta 0+\beta 1NTC_{it}+\beta 2FSQ_{it}+\beta 3LEV_{it}+\beta 4LIQ_{it}+\beta 5GRO_{it}+e_i\ldots\ldots\ldots\ldots\ldots(2)$$

$ROEit=\beta0+\beta1CCCit+\beta2FSQit+\beta3LEVit+\beta4$
$LIQit+\beta5GROit+ei$…………………(3)

$ROEit=\beta0+\beta1NTCit+\beta2FSQit+\beta3LEVit+\beta4$
$LIQit+\beta5GROit+ei$…………………(4)

Where **ROA** represents Return on Asset, **ROE** represents Return on Equity, **CCC** represents Cash Conversion Cycle, **NTC** represents Net Trade Cycle, **FS** represents Firm Size, **LEV** represents firm's financial leverage, **LIQ** represents Liquidity, and **GRO** represents Growth Opportunities.

4. Results and Discussion

This section describes the regression results to conclude the findings. We analyze the impact of working capital policies in two perspectives (I) impact on firm performance and II impact on shareholder's return. with two measures of profitability Return on asset and Return on Equity. Working capital management too measured with two proxies i.e. Net trade cycle and Cash conversion cycle. Firm size, financial leverage, liquidity, and growth opportunities were used as control variables to conclude the findings.

4.1 Working capital policies and firm's performance.

Tables 4.1.1 and 4.1.2 present the regression results, in which the net trade cycle and cash conversion cycle are used respectively as working capital management proxies to analyze the possible impact of the same on the firm's performance. Firstly we conclude the findings by taking variable data as a whole and after that industry-wise analysis is conducted. Results show that the net trade cycle hurts a firm's profitability but this impact is insignificant. We can predict that by squeezing the net trade cycle firms can increase their profitability. In an industry-wise analysis, all the sectors are not on one page. In the Food and Pharma sector, the net trade cycle was insignificantly negatively associated with the firm's performance, and the automobile and chemical sector net trade cycle was found irrelevant regarding the firm's performance point of view. The firm's size and financial leverage are too negatively associated with corporate profitability. As the firms grow and insert more debt into their capital structure, firm performance will move downward. These findings are quite match with second equation in which the cash conversion cycle used as a working capital management proxy. As per findings cash conversion cycle was found to be irrelevant regarding the firm's performance. Whatever policy regarding managing the cash conversion

cycle is adopted by the organization, it has no impact on the firm's profitability. In industry-wise analysis, the cash conversion cycle too found irrelevant except automobile sector in which CCC found an insignificant negative relationship with the firm's performance. These findings quite mismatch with earlier conclusions made by different researchers. Ben Ukaegbu (2014), Kieschnice et al. (2013) concluded in his study that the cash conversion cycle hurt profitability. They argued that to increase investment in working capital, firms need additional financing that ultimately has a certain cost and increases the probability of bankruptcy as well. Hence lowers the profitability of the organizations. Control variables too, interact differently on a firm's profitability as per findings. The firm's size and financial leverage were found to be negatively associated while liquidity and growth opportunities were found to be positively associated with the firm's earnings.

4.2 Working capital policies and shareholders wealth maximization

Tables 4.2.1 and 4.2.2 present the regression results, in which working capital management proxies are used to analyze the possible impact of the same on shareholders' wealth maximization. Findings are concluded in different steps as at first take data of the entire variable as a whole to see the impact and then industry-wise results are compiled to further narrow down our conclusions. It has been found that working capital policies act differently on shareholders' wealth maximization as compared to its impact on a firm's performance. Results show that the net trade cycle hurts a firm's profitability but this impact is very minimal. Financial managers can improve shareholders 'earnings after designing carefully a working capital management policy. The cash conversion cycle too has the same direction as the net trade cycle regarding the impact on return on equity. In industry-wise analysis, results are not surprising as sector-wise too both working capital management proxies are negatively associated with shareholder's wealth maximization. Literature also proves that the cash conversion cycle is negatively associated with profitability. Deloof (2003), Wang (2002), Lazaridis and Try fonidis (2006), Gil et al (2010)) in their studies prove a negative relationship of the cash conversion cycle towards profitability. Firm size, financial leverage, and liquidity are negatively associated with return on equity.

Surprisingly, liquidity is negatively associated with return on equity but the same was not the case regarding a firm's performance as liquidity is positively linked with a firm's return on asset. Growth opportunities as earlier findings negatively associated with shareholder wealth maximization.

5. Conclusions

The present study aims to study the role of working capital policies from the perspective of a firm's performance and shareholder's return by studying different industrial sectors namely the automobile sector, chemical sector, food sector, and pharmaceutical sector of Pakistan. Sample data from 41 firms from four different industrial sectors have been collected for the period of six years ranging from 2010 to 2015. Working capital policies are measured through two proxies i.e. Net Trade Cycle and Cash Conversion Cycle. The impact of working capital policies can be analyzed in two perspectives i.e. regarding firm performance and shareholder's wealth maximization. Firm size, liquidity, financial leverage, and growth opportunities are taken as control variables. It has found that working capital policies impact differently on a firm's performance and shareholder's

wealth maximization. Results suggested that working capital policies have no impact on a firm's performance as a whole and in industry-wise analysis too. This means firm performance is irrelevant to the policies of working capital adopted by the management. On the other hand, working capital policies are negatively associated with return on equity. There is an inverse relationship between working capital and shareholder's return. Lower the trade cycle and cash conversion cycle higher will be the return to the shareholders. Firm size, financial leverage, and liquidity too have an inverse relationship with return on equity. Overall results are not matched with earlier findings of different researchers. This may be because of inconsistent and volatile economic conditions of the country. There may be a need to further explore the reasons in future research.

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Table1. Variables and their measurements

Variables of Study		
Variables	**Symbol**	**Desciption**
Dependent Variales		
Return on Asset	ROA	Ratio of Net Income to Total Assets
Return on Equity	ROE	Ratio of Net Income to Shareholder's Equity
Independent Variables		
Cash Conversion Cycle	CCC	Days A/R +Days Inventory-Days A/P
		A/R /Sales *365+ Inventory/CGS*365 - A/P/CGS*365
Net Trade Cycle	NTC	(Accounts Receivables / Sales)* 365 + (Inventories / Sales) *365 -
		(Accounts Payalbe /Sales)* 365
Control Variables		
Firm Size	FS	Natural Logrithm of Total Assets
Financial Leverage	LEV	Debt/ Total Assets
Liquidity	LIQ	Current Assets / Current Liabilities
Growth Opportunities	GRO	Current Sale - Previous Sale/ Previous Sale

Table 2 Descriptive Statistics

Industry-wise Descriptive Statistics						
Industries	**Firms**		**NTC**	**CCC**	**ROA**	**ROE**
Automobile	11	Mean	57.6365	37.031	0.1216	0.213
		Std. dev	60.702	62.8732	0.101	0.1302
Chemical	15	Mean	21.5551	14.019	0.1135	0.20428
		Std. dev	57.3644	75.3261	0.1377	0.288
Food	8	Mean	30.81	35.3261	0.1627	0.5589
		Std. dev	77.479	81.2728	0.111	0.5753
Pharma	7	Mean	76.119	61.937	0.11	0.1833
		Std. dev	25.03	40.451	0.747	0.098
Panel C: Statistics on Variables						
			N	Mean		Std. dev
Firm Characteristics						
Firm Size			246	9.7966		0.6318
Financial Leverage			246	0.27		0.362
Growth Opportunities			246	0.7637		0.9322
Liquidity			246	2.0033		1.6922
Firm performance Variables						
Return on Assets			246	0.1248		0.1151
Return on Equity			246	0.2722		0.3461
Main Explanatory Variables						
Net Trade Cycle			246	42.7654		61.8967
Cash Conversion Cycle			246	32.5891		70.2299

Table 3 Correlation Matrix

	ROE	ROA	CCC	NTC	FS	LIQ	LEV	GRO
ROE	1							
ROA	.669** (.000)	1						
CCC	-.385** (.000)	-.220** (.001)	1					
NTC	-.425** (.000)	-.195** (.002)	.789** (.000)	1				
FS	.094 (.142)	.019 (.0763)	-.483** (.000)	-.427** (.000)	1			
LIQ	-.131* (.039)	.197** (.002)	.291** (.000)	.332** (.000)	-.232** (.000)	1		
LEV	-.195** (.002)	-.310** (.000)	.017 (.794)	.073** (.256)	.175** (.006)	-.397**	1	
GRO	.244** (.000)	.195** (.002)	-.032 (.620)	.008 (.890)	.081 (.205)	-.050	-.038 (.594)	1

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

Table 4.1.2: Regression results on Return on assets as the dependent variable and Net Trade Cycle as an independent variable along with control variables.

Return on Asset	Panel Data Analysis				
	Full Sample	**Automobile**	**Chemical**	**Food**	**Pharma**
Net Trade Cycle	-0.001	0.000	0.000	-0.001	-0.001
p-value	0.000	0.079	0.457	0.003	0.17
Firm Size	-0.006	0.018	0.003	-0.028	0.079
p-value	0.616	0.575	0.902	0.211	0.013
Financial Leverage	-0.076	-0.044	-0.038	-0.128	-0.094
p-value	0.000	0.693	0.204	0.017	0.032
Growth Opportunities	0.024	-0.033	0.066	0.01	0.007
p-value	0.001	0.18	0.000	0.306	0.443
Liquidity	0.014	0.01	0.051	0.017	-0.009
p-value	0.003	0.131	0.000	0.494	0.477
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
R-square	0.208	0.138	0.372	0.61	0.346
N	246	66	90	48	42

Table 4.1.2: Regression results on Return on assets as independent variables while the Cash conversion cycle is used as an independent variable along with the control variable.

Return on Asset	Panel Data Analysis				
	Full Sample	**Automobile**	**Chemical**	**Food**	**Pharma**
Cash Conversion Cycle	0.000	-0.001	0.000	0.000	0.000
p-value	0.000	0.063	0.081	0.175	0.693

Firm Size	-0.010	0.008	-0.005	-0.012	0.099
p-value	0.403	0.817	0.797	0.597	0.02
Financial Leverages	-0.067	0.02	-0.034	-0.201	-0.118
p-value	0.001	0.871	0.239	0.000	0.019
Growth Opportunities	0.024	-0.031	0.06	0.011	0.009
p-value	0.001	0.216	0.001	0.291	0.387
Liquidity	0.013	0.014	0.051	-0.013	-0.014
p-value	0.003	0.071	0.000	0.593	0.367
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
R-square	0.205	0.147	0.391	0.538	0.313
N	246	66	90	48	42

Table 4.2.1: Regression results on return on equity as a dependent variable while NTC is taken as an independent variable along with the control variable.

Return on Equity	Panel Data Analysis				
	Full Sample	**Automobile**	**Chemical**	**Food**	**Pharma**
Net Trade Cycle	-0.003	-0.001	-0.001	-0.004	-0.001
p-value	0.000	0.005	0.094	0	0.033
Firm Size	-0.053	0.023	0.018	-0.205	0.033
p-value	0.111	0.581	0.706	0.069	0.43
Financial Leverage	-0.225	0.057	-0.161	-0.313	-106
p-value	0.000	0.685	0.018	0.228	0.075
Growth Opportunities	0.087	0.013	0.161	0.041	0.014
p-value	0.000	0.681	0	0.375	0.301
Liquidity	-0.017	-0.001	0.030	-0.181	-0.019
p-value	0.176	0.943	0.206	0.142	0.304
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
R-square	0.298	0.187	0.296	0.644	0.283
N	246	66	90	48	42

Table 4.2.2: Regression results on Return on equity as a dependent variable and CCC is the main independent variable along with control variables.

Return on Equity	Panel Data Analysis				
	Full Sample	**Automobile**	**Chemical**	**Food**	**Pharma**
Cash Conversion Cycle	-0.002	-0.001	-0.001	-0.003	0.001
p-value	0.000	0	0.002	0.015	0.249
Firm Size	-0.057	-0.009	0.001	-0.108	0.099

p-value	0.114	0.825	0.985	0.367	0.095
Financial Leverages	-0.197	0.257	-0.137	-0.675	-0.177
p-value	0.001	0.088	0.029	0.011	0.012
Growth Opportunities	0.084	0.015	0.133	0.066	0.017
p-value	0.000	0.615	0.001	0.226	0.231
Liquidity	-0.023	0.011	0.033	-0.33	-0.035
p-value	0.084	0.235	0.148	0.011	0.115
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes
R-square	0.251	0.279	0.351	0.562	0.215
N	246	66	90	48	42