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Effect of Cash Conversion Cycle on Profitability of the firm: A Study of Oil & Gas and Engineering Sector of Pakistan

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ARTICLE DETAILS	ABSTRACT
<p>History Revised format: February 2020 Available Online: March 2020</p>	<p>The research is aiming at assessing the effect of cash conversion cycle on profitability of the firm. Three components are used to measure cash conversion cycle (CCC); average receivable period (ARP), average inventory period (AIP) and average payable period (APP). Henceforth, cash conversion cycle and its determinants are taken as Independent variables. The dependent variable is profitability being measured by return on asset (ROA). The data was collected with the help of pooled data containing a sample of 10 firms of two manufacturing sector such as Oil & Gas and Engineering, listed on PSX for the period 2010-2018. Regression and correlation techniques were used for analysis and come up with the outcomes that average receivable period and average inventory period have an adverse significant association with profitability of the firm except average payable period. In the end, there exists a highly negative significant association among CCC and firm's profitability as ROA. The results showed that lesser the no. of days of CCC, the firm has greater profitability. This paper contributes to the literature, which shows the association amongst CCC and ROA.</p>
<p>Keywords Average Inventory Period, Average Receivable Period, Average Payable Period, Cash Conversion Cycle, ROA</p>	
<p>JEL Classification: G31, G39,</p>	



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1. Introduction

In the global economic growth, Pakistan is the second largest country in the manufacturing sector after agriculture sector, and the current GDP is 21.3%. The manufacturing industry has grown rapidly since independence 1947 and the expansion has been well sustained over the past decade. Though there were

many problems faced by the manufacturing sectors. Like as, supplies of raw material and capital equipment has been so uncertain. The major problem of the manufacturing sector in Pakistan is the excess productive capacity in various industrial categories and it is due to the weak administration arrangements. In general, the problems like collection policies and payment policies are faced by the manufacturing firms. In financial management, cash management decisions are very important as it is considered to more common and treasured resource of any firm in the business world.

The decisions of companies regarding financial management are consisted on three major areas, which are as working capital for short term investment, capital structure for long term assets and capital budgeting for long term financing. According to these areas, the WCM has a greater importance in the company because it affects the company's overall profitability and liquidity (Appuhami, 2008).

According to Majeed, Makki and Saleem (2013), WCM is examined by two approaches: static and dynamic. The first method is grounded on the liquidity ratios. Generally used are current ratio and quick ratios built on balance sheet, which measures the liquidity position of the company. The later method is connected to the operations of the business. Cash conversion cycle (CCC) is an utmost dynamic dimension of the time among cash payment for raw constituents and then receiving it as accounts receivables. Rendering to liquidity management, CCC measures the liquidity encompasses both income statement and balance sheet data with measurement of time.

CCC is grounded on an analysis of three partial cycles. The first cycle is inventory and second is accounts receivables, which spot the span of a purported operational cycle. The third cycle is that of current liabilities, which is one artificial measurement of the aforesaid CCC (Bueniasz, 2011).

Numerous researchers such as Appuhami (2008), Bodie (2000) and Keown (2003) have instituted that CCC is the vital component of the WCM. CCC is well-thought-out to be all-inclusive measure of WCM for the reason that it efficiently reflects the time lag amongst the spending of raw materials founded on procurement and the assemblages from the borrowers on behalf of the sales of finished goods (Padachi, 2006). When the CCC has longer time span, the company make more investment in working capital. When CCC has shorter span, it would upsurge the profitability as it entails the increased sales (Attari, 2012). Though, when the investment rate has increased in working capital more than the profits connected with more inventories, it would decline CCC. Several researchers have claimed about the administration of short-term assets in an operative and efficient way and the liabilities such as short-term liabilities are certainly an imperative question in the administration of these assets and liabilities and investigated how much margin these things can do with the presence of firm.

The research emphases entirely on the CCC being the gadget of WCM of Oil & Gas and Engineering sector. In Pakistan, there are very few investigations that have been done concerning WCM and there is also a little-known research on CCC association with ROA. The scope of this research is restricted to the two substantial sectors are Oil & Gas, and Engineering. This paper evaluated the research problem of CCC with the emphasis of profitability of the firm: measured by ROA.

The current study is assessing the effect of CCC and the profitability in standings of ROA, of PSX listed companies and to detect substantial variables that are persuading CCC proficiency. Furthermore, the objective is also to evaluate the CCC as a measure of WCM for two sectors such as Oil & Gas and Engineering. The outcomes of the study will be supportive for academicians and industry authorities for policymaking and control tenacities.

The study aims are:

1. To scrutinize the current studies regarding WCM and CCC
2. To evaluate CCC, which shows as a measure of WCM

3. To analyzes CCC and degree of association with the company profitability as ROA

2. Literature Review

Conferring to Samiloglua and Akgunb (2016), the connection between WCM and performance of the firm, where performance given as profitability is measured by ARP, APP and CCC, was inspected. The linkage was researched on 120 manufacturing firms of Turkey, which were Istanbul Stock Exchange listed, as 2003-2012-time span. Multiple linear regression depicted the WCM connection with the firm's performance and found, from this paper, a negative substantial association of ARP with ROE, ROA, NPM and OPM. They expected that firms would lower the ARP, APP and CCC, then they can achieve value for their shareholders.

Wasiuzzaman (2015) examined that the imperative extent of finance is working capital, that has not been well examined. She subsidized her research to the literature and analyzed the profitability, calculated by ROE and ROA, together with working capital. She applied ordinary least square (OLS) on 160 manufacturing firms, as a sample size, to depict the relationship and the results showed that working capital & its elements have negative connection with firm's profitability, regardless of the payables, which showed a negative association with profitability. She made a comparison between this research to the additional studies, exposed that the connection amongst working capital & profitability is not momentous.

Trinh and Mai (2016) analyzed various factors such as the size of the firm, profitability, leverage, capital expenditure, cash flow, investment opportunities and profitability with CCC and level of cash holding. The results showed that level of cash holdings has affected the profitability and capital expenditure, which are considered as two important variables. As well as it has robust impact on the liquidity of the firm. In addition, they specified that WCM is affected by policies of cash holdings under financial conditions.

Hoang (2015) investigated the WCM association with the profitability of the firm. The researcher selected 98 manufacturing Ho Chi Minh City Stock Exchange listed companies for 6 years from 2009-2014. Results displayed that CCC, AIP, ACP, APP and net trade cycle have momentous as well as negative association with ROA. The researcher analyzed that firms can achieve the optimal level by lowering the CCC and its components, to progress the profitability.

Sharman and Kaur (2016) investigated the working capital and the sample was chosen as Bharti Airtel telecom company, for the period 2007-8 and 2014-15. This paper analyzed the ratio analysis, such as, current ratio, gross profit ratio, quick ratio, receivable turnover ratio, operating profit ratio and inventory turnover ratio, evaluated by statistical and econometrics techniques to know the association with performance. All the listed ratios showed satisfactory results with the performance, except current ratio. The researchers institute that there lies a noteworthy negative association among ratios and profitability.

Anser and Malik (2013) explored about CCC and firms' profitability. CCC is the foremost instrument, which is used to assess the risk-return association while managing liquidity. The researcher was anxious about appraising how CCC marks the manufacturing sector's profitability, which is listed at PSX of Pakistan, for five years. The research outcomes exhibited that manufacturing firms have lower ROA, on regular basis, and high ROE, on regular basis, with CCC. According to the regression results after adjusting for heteroskedasticity showed that CCC has inverse but noteworthy association with ROA.

Farooq et al., (2016) have done empirical investigation on CCC and its association with working capital, liquidity, and firm's performance. The investigators have verified the study by using descriptive analysis techniques, Pearson correlation and ANOVA. The outcomes suggested that CCC is statistically noteworthy connected with profitability of the company being measured by EBIT. This study explored

that the CCC period in days effects the firm size, profitability, so, it has negative association with the projected dependent variables as; ROA, ROE and sales revenue.

Leeper and Chambers (2013) argued that CCC is a suitable measure of firm's actual WCM and particularly the cash managing. This research was offered to inspect the stock of cash managing- a zone not being well-approached in the emerging nations similar to Pakistan.

Shah (2013) institute the association amongst CCC and ROA with a moderate part of the size of the firm. The researcher offered a painstaking analysis of cash managing, inventory managing, and trade credit managing techniques upshot the WCM in textile sector of Pakistan, with the influence of firm's profitability.

Singh (2013) investigated the managing of working capital transversely among various industries in India. The investigator had assumed financials from diverse companies fitting to seven Industries like; IT, automobile, steel, telecommunication, cement, chemicals, fertilizer and petrochemicals. The author had taken diverse parts of working capital like; return on capital employed, current ratio, working capital turnover ratio, inventory turnover, days inventory outstanding, days payable & days sales outstanding and CCC. This study used descriptive analysis and examined that working capital components vary across different industries

By reviewing literature, we come up with following hypothesis;

H1: ARP has a substantial association with ROA

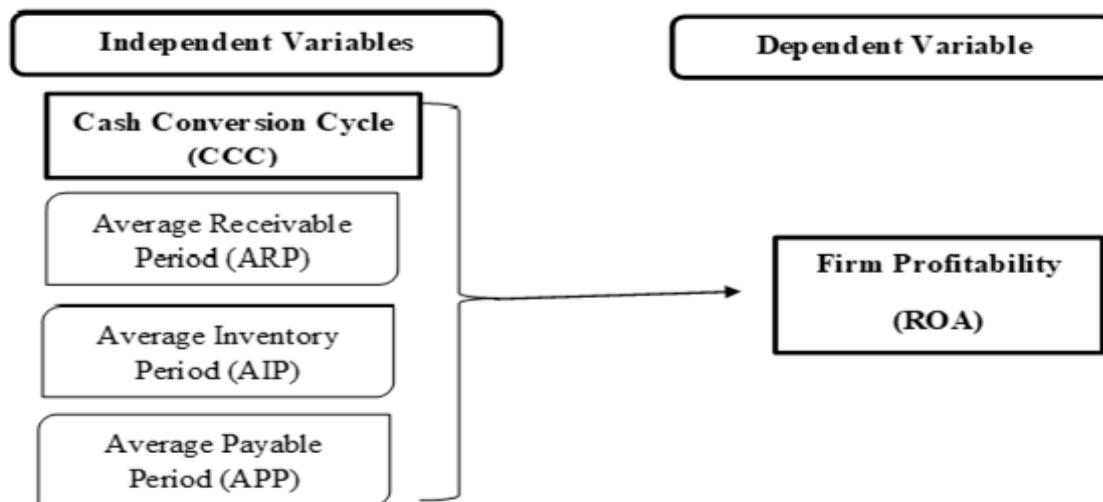
H2: AIP has a substantial association with ROA

H3: APP has a substantial association with ROA

H4: CCC has a substantial association with ROA.

2.1. Theoretical Framework

Research Model:



3. Methodology

3.1 Research Design

This study is essentially directed to inspect the conjectured associations amid CCC and determinants of CCC with the firm's profitability concluded by correlation and regression analysis. The analysis of correlation is given the results to know the exact associations between the CCC length and its factors with profitability. The regression analysis is used for analyzing the independent variables association with

dependent variables.

3.2 Population

This study is conducted on Pakistan Stock Exchange (PSX) of Pakistan. In the process of research, there are 36 industries, included manufacturing and services, are listed on PSX website. The target population of this research study was two manufacturing sector such as Oil & Gas and Engineering sector, which are listed on PSX. Service companies are excluded from this current research, because of non-availability of inventory.

3.3 Sample Size

The sample comprises of PSX listed firms across the two industries (oil & gas, and engineering) of manufacturing sector. From each industry, there are five firms selected as a sample.

3.4 Sampling Technique

The companies are randomly taken from each industry, by using the Judgmental Sampling Technique. The data used for analysis is for the period 2010 to 2018.

3.5 Data Collection

Data of this study was collected from secondary sources, which contains the Oil & Gas and Engineering Industry data, for the years 2010 to 2018. The needed secondary data was collected from the financial statements available in the Annual Reports taken from the official website of the companies and the PSX Annual Reports, which covers the Nine Years at a glance period. We used the panel data, containing both time-series and cross-sectional.

4. Data Analysis

4.1 Regression Results

Hypothesis 1:

H₁: Average receivable period has a substantial association with ROA

Table # 1: Model Summary^b ARP and ROA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.705 ^a	.698	.680	0.59468

a. Predictors: (Constant), Average Receivable Period

b. Dependent Variable: Return on Asset.

As the value of R is 0.705, which shows strong degree of association between ROA and ARP. R square is 0.698, which is 69.8%. This R square value shows that 69.8% variation in ROA is due to average receivable period.

Table # 2: Coefficients^a ARP and ROA

Model		Unstandardized		Standardized		Correlations			Collinearity Statistics		
		Coefficients		Coefficients		Zero-order	Partial	Part	Tolerance	VIF	
		B	Std. Error	Beta	T						Sig.
1	(Constant)	-8.458	4.719		-5.530						
	ARP	-.557	.173	-.463	4.884	.000	-.779	-.643	-.559	.997	1.003

a. Dependent Variable: Return on Asset.

As the multiple regression line is:

$$ROA = \beta_1 + \beta_2 (ARP)$$

$$= -8.458 + (-0.557)$$

The value of β_1 is **-0.557** which shows that 1 day increase in ARP period will lead to decrease 0.557% ROA. As the value of p is 0.000 and the level of significance is 5%, which shows the α value. The p-value is less than α value and the value of t is 4.884, which is greater than $t_{\alpha/2, (n-k)}$ (2.000), so we reject H_0 . Thus, average receivable period has statistically significant association with ROA.

Hypothesis 2:

H_2 : AIP has a substantial association with ROA

Table # 3: Model Summary^b**AIP and ROA**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.809 ^a	.742	.701	0.06609

a. Predictors: (Constant), Average Inventory Period

b. Dependent Variable: Return on Asset.

As the value of R is 0.809, which shows that strong degree of association between ROA and AIP. R square is 0.742, which is 74.2%. This R square value shows that 74.2% variation in ROA is due to average inventory period.

**Table # 4: Coefficients^a
Average Inventory Period and ROA**

Model		Unstandardized		Standardized		Correlations			Collinearity Statistics		
		Coefficients		Coefficients		Zero-order	Partial	Part	Tolerance	VIF	
		B	Std. Error	Beta	T						Sig.
1	(Constant)	-6.615	1.910		-3.205	.002					
	AIP	-.781	.135	-.224	2.077	.042	-.796	-.765	-.624	.995	1.005

a. Dependent Variable: Return on Asset.

As the multiple regression line is:

$$\begin{aligned} \text{ROA} &= \beta_1 + \beta_2 (\text{AIP}) \\ &= -6.615 + (-0.781) \end{aligned}$$

The value of β_1 is **-0.781** which shows that 1 day increase in AIP will lead to decrease 0.781% (ROA). As the value of p is 0.042 and the level of significance is 5%, which shows the α value. The p-value is less than α value and the value of t is 2.077, which is greater than $t_{\alpha/2, (n-k)}$ (2.000), so we reject H_0 . Thus, average inventory period has statistically significant association with ROA.

Hypothesis 3:

H_3 : APP has a substantial association with ROA

Table # 5: Model Summary^b
APP and ROA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.679 ^a	.623	.594	0.27645

a. Predictors: (Constant), Average Payable Period
b. Dependent Variable: Return on Asset.

As the value of R is 0.679, which shows that strong degree of association between ROA and APP. R square is 0.623, which is 62.3%. This R square value shows that 62.3% variation in ROA is due to average payable period.

Table # 6: Coefficients^a (APP and ROA)

Model		Unstandardized Coefficients		Standardized Coefficients		Correlations			Collinearity Statistics		
		B	Std. Error	Beta	T	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-7.829	1.642		-3.639	.001					
	APP	.289	.166	.197	1.743	.087	.526	.495	.456	.929	1.077

a. Dependent Variable: Return on Asset.

As the multiple regression line is:

$$\begin{aligned} \text{ROA} &= \beta_1 + \beta_2 (\text{APP}) \\ &= -7.829 + (-0.289) \end{aligned}$$

The value of β_1 is **-0.289** which shows that 1 day increase in APP will lead to increase 0.289% ROA. As the value of p is 0.087 and the level of significance is 5%, which shows the α value. The p-value is greater than α value and the value of t is 1.743, which is less than $t_{\alpha/2, (n-k)}$ (2.000), so we do not reject H_0 . Thus,

average payable period has no statistically significant association with ROA.

Hypothesis 4:

H₄: CCC has a substantial association with ROA

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.837 ^a	.788	.733	0.18358

a. Predictors: (Constant), Cash Conversion Cycle
b. Dependent Variable: Return on Asset.

As the value of R is 0.837, which shows that strong degree of association between ROA and CCC. R square is 0.788, which shows that 78.8% variation in ROA is due to CCC.

Model		Unstandardized		Standardize		Correlations			Collinearity Statistics		
		B	Std. Error	Beta	T	Sig.	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-6.300	3.335		-2.841	.006					
	CCC	-.648	.277	-.382	2.666	.014	-.767	-.715	-.582	.993	1.007

a. Dependent Variable: Return on Asset.

As the multiple regression line is:

$$\text{ROA} = \beta_1 + \beta_2 (\text{CCC})$$

$$= -6.300 + (-0.648)$$

The value of β_2 is **-0.648** which shows that 1 day increase in CCC will lead to decrease 0.648% ROA. As the value of p is 0.014 and the level of significance is 5%, which shows the α value. The p-value is less than α value and the value of t is 2.666, which is greater than $t_{\alpha/2, (n-k)}$ (2.000), so we reject H_0 . Thus, CCC has statistically substantial association with ROA.

4.2 Correlation Analysis

The Table#9 shows that the correlation between ROA & ARP is -.350, which shows that longer the average receivable period tends to lower the firm's profitability and ARP is significant with ROA, at 5% level of significance. The correlation coefficient between ROA & AIP is -0.254, which shows that longer the average inventory period tends to decrease profitability and AIP is significant with ROA, at 5 % level of significance. The correlation coefficient between ROA & APP is 0.464, which shows that longer the average payable period tends to greater the profitability and APP is significant at 1% level of significance with ROA, but APP is not significant at 5% level of significance. The correlation coefficient between ROA & CCC is -0.069, which shows that longer the CCC period will decrease the profitability of the firm and CCC is significant with ROA, at 5% level of significance. This indicates that companies can upsurge profitability by dropping the days of CCC, AIP and ARP.

Table # 9: Pearson's Correlation

		ROA	ARP	AIP	APP	CCC
ROA	Pearson Correlation	1	-.350**	-.254*	.464**	-.069
	Sig. (2-tailed)		.006	.047	.087	.011
	N	60	60	60	60	60
ARP	Pearson Correlation	-.350**	1	.176	-.108	.766**
	Sig. (2-tailed)	.006		.178	.411	.000
	N	60	60	60	60	60
AIP	Pearson Correlation	-.254*	.176	1	-.341**	.727**
	Sig. (2-tailed)	.047	.178		.008	.000
	N	60	60	60	60	60
APP	Pearson Correlation	.464**	-.108	-.341**	1	-.393**
	Sig. (2-tailed)	.087	.411	.008		.002
	N	60	60	60	60	60
CCC	Pearson Correlation	-.069*	.766**	.727**	-.393**	1
	Sig. (2-tailed)	.011	.000	.000	.002	
	N	60	60	60	60	60

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

5. Conclusion

Cash conversion cycle shows the liquidity stance of the firm. In finance, the management of current assets as well as current liabilities is important to handle for both small and large firms. The cash cycle is a main factor of cash management and it is very important to enhance the profitability of the firms. However, it shows how efficient a firm in its payments of bills, collection of receivables and inventory converted it into cash (Anser & Malik, 2013). The enterprises can get greater profitability by lowering the time period of CCC through decreasing the collection period of receivables, decreasing or lowering the selling period of inventory and lengthening the period of credit payment. After applied the regression and correlation analysis, the researcher found the results that ARP and AIP have significant negative connection with firm's profitability, which measured by ROA. Whereas, an average payable period has positive connection with ROA, but has not shown a substantial association with ROA, proxy for profitability. Also, foremost, there exists a exceedingly negative substantial connection of CCC with ROA. The results showed that less the number of days to convert the sales into cash, firm have greater profitability. The study is limited to the Pakistan manufacturing sector where there are very few researches have been done on CCC. Many researchers can use this study for further analysis by using gross profit, net profit margin or EBIT.

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