

## **Working Capital Management and Firm Performance: The Case of Industrial Corporations in Palestine**

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### **Abstract**

This study aims to find the impact of working capital management on the financial performance of industrial corporations in Palestine. We used a sample of 13 industrial firms that were listed on the Palestine Securities Exchange for years 2002 to 2018. We used cash conversion cycle and its components as independent variables and both return on assets and return on equity as dependent variables. Moreover, since deferred checks are vital in commercial transactions in Palestine, we tried to take into consideration the effect of including checks under collection and deferred checks on performance. Eight panel econometric models were estimated. The study found that the cash conversion cycle and firm size have a significant positive impact on the profitability of industrial corporations, while leverage is significantly negative with profitability. In addition, it was found that Palestinians firms maintain a sizable working capital which may be due to a long cash conversion cycle (about nine months average) and to conservative policies due to instable economic and political conditions. These findings are consistent with several previous studies from other countries such as Jordan, Pakistan, India and Portugal.

**Keywords:** Working Capital, Cash Conversion Cycle, Return on Assets, Return on Equity, Leverage.

### **1. Introduction**

Working capital management (WCM), the management of short term assets and liabilities, plays an important role in the success of firms. If the company does not manage its working capital, it may not meet its current obligations and reverting to external financing in this case may be expensive. Most corporations have a huge amount of cash invested in working capital in addition to partial financing of working capital by short-term debts (Uyar, 2009). Therefore, working capital management is a very important component of firm's financial management (Deloof, 2003). WCM focuses on managing current assets and liabilities and try to reach the optimal level

of each component through managing cash, inventories, account receivables and payables (Aregbeyen, 2013).

Working capital management has an important role in balancing between profitability and liquidity risk and thus may affect the firm's value. Firms try, through WCM, to avoid failing on debts and short term liabilities to avoid bankruptcy and getting out from the market. Profitability is considered one of the vital goals that management try to achieve or else will stop. The ultimate goal of the firm is to maximize shareholders wealth by increasing the value of their shares. This can be achieved by generating high profits at a stated level of risk and taking into account its ability to continue and expand and face future commitments (Deloof, 2003).

Even though much research about the impact of working capital management on firm's profitability and performance were undertaken, in both developed and developing countries (Bieniasz, 2011), this study adds to the literature by examining the working capital management and its impact on profitability in an extremely small underdeveloped markets. Specifically, it examines the effect working capital management on Palestinian industrial firm's performance. This paper aims to study the impact of the annual cash conversion cycle and its components on different financial performance indicators i.e. return on assets (ROA) and return on equity (ROE) of industrial corporations operates in Palestine. The effect of the following WCM variables is investigated: the annual cash conversion cycle, average collection period, inventory turnover, average payment period. Moreover, since, checks are used to collect and pay amounts and dues in Palestine, and these checks are used as credit instrument that due in the future i.e. they express receivables or payables rather than cash. This study took into account these checks when calculating cash conversion cycle and estimated all models with and without these checks. A sample of 13 Palestinian industrial firms has been chosen. The data covers 17-years period from 2002 to 2018 of companies listed on the Palestinian Security Exchange (PSE).

The industrial sector is one of the pillars of the Palestinian economy due to its multiple and prominent contributions to the economic and social development, Despite the obstacles facing the industrial sector, it has thrived recently and has positively impact the Palestinian exports. It is the second largest sector in Palestine after services sector and represents 13.5% out of all firms in Palestine and has a growth rate of 5% approximately. It also contributes 13% to the GDP. By the end of 2018 the number of industrial corporations listed on PSE was 13. The sector has grown rapidly during the twenty-first century and it is considered a major source for employment and economic growth. So finding the impact of working capital management on the profitability of Palestinian industrial sector is important for the firms to be able to understand the effect of WCM on profitability and its value. It is helpful to both firms' managers and economic policy makers.

The rest of this paper is structured as follows. Section 2 reviews previous theoretical and empirical studies that deal with working capital management and financial performance. Section

3 provides the research methodology, including the data, variables, and empirical models used to complete this study. Section 4 and 5 provides the results and discussions for the impact of working capital management on the financial performance of industrial corporations in Palestine. Lastly, section 6 concludes this study and provides policy guidelines and proposals for further research.

## **2. Literature Review**

Much previous research studied the impact of working capital management on the financial performance and profitability. Deloof (2003) has investigated the relationship between working capital management and corporate profitability for a sample of 1009 large Belgian non-financial firms for a period of 5 years and used several measures of working capital management including number of days of account receivables, account payables and inventory. The results indicated that companies with less number of days of account receivables and inventory are more profitable. Padachi (2006) examined the trends in working capital management and its impact on firm's performance for a sample of 58 small manufacturing firms for a period of 5 years and found a strong relationship between working capital and profitability measured by return on assets. Raheman and Nasr (2007) found that cash conversion cycle has a negative impact on profitability which means less cash conversion cycle is associated with higher profitability by studying this relationship on 94 firms listed in Karachi stock exchange for a period of 6 years.

Juan García and Martínez (2007) examined the empirical evidence about the effect of working capital management on the profitability of small and medium sized firms in Spain for a sample of 8,872 SMEs for 7 years and demonstrated that higher profitability can be achieved by reducing firm's number of days of account receivables and inventories. Moreover, shortening the cash conversion cycle also improves the firm's profitability. Also, Ramachandran and Janakiraman (2009) analyzed the relationship between working capital management efficiency and earnings before interest and taxes of the paper industry in India and indicated that days of account payable has a significant negative relationship with EBIT. Deploying payments to suppliers improves the EBIT. In USA, Gill, Biger and Mathur (2010) found a significant relationship between the cash conversion cycle and profitability measured by gross operating profit. They state that managers can generate profits by handling the cash conversion cycle correctly and keeping accounts receivables at an optimal level.

Bieniasz and Golaś (2011) investigated the effect of working capital management on the food industry enterprises profitability and found that firms with shorter working capital cycles have relatively higher rates of profitability. Sharma and Kumar (2011) examined the impact of working capital on profitability of Indian firms for a sample of 263 non-financial firms listed in Bombay stock exchange from 2000 to 2009 and the results reveal that working capital management has positive impact on profitability where number of days in inventory and number

of days account of payables are negatively correlated with the profitability and number of days of account receivables and cash conversion cycle as a whole exhibits a positive relationship with corporate profitability.

Vural and Çetenak (2012) studied the effect of working capital management and profitability for a sample of 75 manufacturing firms listed on Istanbul stock exchange market for 8 years period and found that there is a negative relationship between account receivables in days, cash conversion cycle and profitability where leverage was used as a control variable and has a negative relationship with firm value and profitability. Abuzayed (2012) investigated the effect of working capital management and firm's performance in emerging markets in a case of Jordan and found that profitability is affected positively with the cash conversion cycle for the firms listed in Amman stock exchange. Wesley, Musiega, Douglas and Atika (2013) studied the relationship between working capital and financial performance of manufacturing firms listed on the Nairobi securities exchange with a sample of 20 companies for a period of 5 years and found that working capital proxies and control variables are significant to performance.

Awad and Jayyar (2013) studied the directional effect of working capital management and liquidity on profitability and vice versa and found that there is a bidirectional causal relationship between working capital and profitability and confirms the necessity of future research about the directional relationship of components of working capital management and profitability. Aregbeyen (2013) investigated empirically the effects of working capital management on the profitability of a sample of 48 large manufacturing firms listed in the Nigerian stock exchange for the period of 1993 to 2005 and results indicated that the firms have been inefficient with WCM and caused significant reductions in profitability and concludes that improving the efficiency of WCM is essential. They recommended that firms should shorten account payable period, account receivables and inventory turnover in days to reduce their CCC. Pais and Gama (2015) aimed to provide empirical evidence on the effects of working capital management and the profitability of SMEs Portuguese firms and indicated that reduction in the inventories held and in the number of days that firms take to settle their commercial liabilities and to collect payments from customers are associated to higher corporate profitability. Shah and Gujar (2018) investigated the impact of working capital management on profitability of a pharmaceutical and chemical firms listed on Karachi stock for a sample of 25 firms and found that cash conversion cycle has a positive impact on the profitability excepts days sales outstanding which is insignificantly related to return on assets. When using in return on equity results shows that all variables have insignificant positive relationship except for days of inventory outstanding which has insignificant negative impact on profitability.

Mahmood, Han, Mubeen and Shahzad (2019) evaluated the moderating effects of firm size and leverage on the working capital finance and profitability relationship among Chinese firms during 2000 to 2017 applying the generalized method of moments GMM technique. The results

revealed that the break-even point of the working capital profitability relationship for all subgroups (small, large, low leverage and high leverage firms) shifts when firms expand or leverage level change.

### **3. Sample and Variables**

#### **3.1 Sample**

Data are collected manually from annual reports of industrial corporations downloaded from the Palestine Stock Exchange website for the seventeen years period from 2002 to 2018 based on the availability of data. The final data set is balanced panel data because the majority of the observation was available every time period. The final data set is 183 firm-year observations.

#### **3.2 Variables Description**

##### **3.2.1 The Dependent Variables**

**a. Return on Assets (ROA):** This ratio measures the firm's profits obtained in relations to the assets that are used (Mbithi, 2013). It measures the efficiency of management in generating profits from the firm's assets and is calculated by:

$$ROA = \text{Net income before taxes} / \text{total assets}$$

**b. Return on Equity (ROE):** This ratio measures the firm's profits obtained in relations to the shareholders equity (Rashid & Kemal, 2018). It is calculated by:

$$ROE = \text{Net income before taxes} / \text{total equity}$$

##### **3.2.2 The Independent Variables**

There are several independent variables included in our models. These include:

###### **a. Average collection period**

We had two measures for ACP. One without taking Checks under collection into consideration

$$ACP_{wo} = [\text{Average Account Receivables} / \text{Net Sales}] * 365$$

And the other after taking checks under collection

$$ACP_{wc} = [(\text{Average Account Receivables} + \text{Average Checks under collection}) / \text{Net Sales}] * 365$$

**b. Inventory turnover in days**

$$ITO = [Average\ inventory / Cost\ of\ goods\ sold] * 365$$

**c. Average payment period**

We had two measures for APP. One without taking deferred checks into consideration

$$APP_{wo} = [Average\ Account\ Payables / Cost\ of\ goods\ sold] * 365$$

and the other after taking deferred checks into consideration

$$APP_{wc} = [(Average\ Account\ Payables + Average\ Deferred\ Checks) / Cost\ of\ goods\ sold] * 365$$

**d. Cash Conversion Cycle (CCC)**

Cash conversion cycle is used as a comprehensive measure of working capital management and it shows the time difference between paid up for the purchases of raw materials and the collection of cash generated from the sale of finished goods (Uyar, 2009), and it is calculated by:

$$CCC = Average\ collection\ period + inventory\ turnover\ in\ days - Average\ payment\ period$$

Since most variables in our model are in percentages (ratios), we divided the CCC by 365 so that we get the number per day rather than in days (average daily cash conversion cycle), as followed:

$$ACCC = CCC / 365$$

where two ACCC measures were used as following:

*ACCC<sub>wo</sub>* means Annual cash conversion cycle without taking Checks under collection and deferred checks into account, and

*ACCC<sub>wc</sub>* means Annual cash conversion cycle taking Checks under collection and deferred checks into account.

**e. Firm Size (Size)**

Firm size is used as a control variable (Padachi, 2006) and is measured by:

$$SIZE = \text{Log} (Total\ Sales)$$

**f. Leverage (Debt Ratio)**

The proportion of a company's assets which are financed through debt and it used as control variable (Gill et al, 2010) and measured as:

$$Debt\ Ratio = Total\ Debt / Total\ Assets$$

## 4. Data Analysis

### 4.1 Descriptive Statistics

Table 1 presents the descriptive statistics for the variables used in the sample. It shows the average, and standard deviation the minimum and maximum values of all variables used in the study.

**Table 1: Descriptive Statistics**

	Mean	Median	Maximum	Minimum	Std. Dev.	N
ROA	0.051	0.050	0.270	-0.622	0.094	183
ROE	0.066	0.072	0.330	-1.209	0.144	183
ACCCwo	0.552	0.449	6.769	-2.717	0.726	183
ACCCwc	0.609	0.560	6.698	-4.587	0.771	183
ACPwo	118.5	76.53	2,350	0	182.8	183
ACPwc	171.9	140.5	2,350	22.3	179.5	183
APPwo	94.02	53.88	1,219	0.63	150.05	183
APPwc	126.68	71.57	1,927	3.08	194.89	183
ITO	177.07	148.59	947.12	0	156.50	183
Leverage	0.283	0.240	2.369	0.028	0.220	183
Size	15.568	15.732	18.400	10.559	1.388	183

The ACCCwo has a mean value 0.552 which is equivalent to 201 days with a standard deviation of 0.726 and the ACCCwc has a mean value 0.609 which is equivalent to 222 days with a standard deviation of 0.771. This is long relative to industrial sector in other countries which are 1-3 months. The minimum values of -2.717 and -4.587 means the business model receives money up front or much quicker compared to what they spend. The difference between the mean of ACPwo and ACPwc indicate the effect of Checks under collection (171.9-118.5=53.4 days) while the Difference between APPwo and APPwc is a result of deferred checks (126.68-94.02=32.66 days).

In the same way the average profitability measured by ROA for Palestinian firms is 5.01% with a standard deviation of 0.094 which is higher than industrial firms in other countries. The average return on equity is 6.60% and the maximum value is 33% with a standard deviation of 0.144.

The results show that the average debt ratio (total debt/total Assets) for the Palestinian industrial companies is 28.3% with a standard deviation of 0.220. This ratio is low compared to firms in industrial countries. This is due to the conservative policies Palestinian firms use in their leverage.

## 4.2 Correlation Analysis

Table 2 shows the Pearson correlation coefficient between the different variables of the models. The correlation coefficient between dependent variables (ROA and ROE) is high indicating a small measurement error in the dependent variable. Other high correlations between independent variables occur in different models not the same model. This will assure the absence of multicollinearity in all regression models.

**Table 2: Pearson correlation coefficient**

	ROA	ROE	ACCCWC	ACCCWO	ACPWC	ACPWO	APPWC	APPWO	ITO	LEVERAGE	SIZE
ROA	1.00										
ROE	0.97	1.00									
ACCCWC	0.13	0.11	1.00								
ACCCWO	0.11	0.09	0.96	1.00							
ACPWC	0.02	(0.01)	0.68	0.73	1.00						
ACPWO	0.01	(0.02)	0.63	0.72	0.97	1.00					
APPWC	(0.19)	(0.20)	(0.44)	(0.26)	0.12	0.14	1.00				
APPWO	(0.22)	(0.22)	(0.43)	(0.30)	0.13	0.15	0.96	1.00			
ITO	(0.03)	(0.04)	0.47	0.57	0.23	0.19	0.33	0.28	1.00		
LEVERAGE	(0.07)	(0.01)	(0.28)	(0.25)	(0.13)	(0.10)	0.23	0.23	(0.07)	1.00	
SIZE	0.32	0.37	0.02	0.03	(0.16)	(0.06)	(0.37)	(0.38)	(0.25)	0.20	1.00

Table 2 shows that cash conversion cycle (ACCCwo & ACCCwc) is positively correlated with profitability of the firm measured by ROA (%13, %11) and profitability of the firm measured by ROE (%11, %9). This means that the more average cash conversion cycle per day are more able to generate profits. On the other hand, leverage is highly significant but negatively correlated with cash conversion cycle (%28, %24). These results are consistent with (Rehman, 2007).

The company size is positively correlated with ROA (%32). An interesting result shows a positive correlation between the size of the firm and ACCC (%2), this may be due to the credit facilities that large companies give to their customers or it may be due to commitment of large companies to pay their obligations on time and rapidly which is consistent with (García et al., 2007).



## 5. Estimation Results

In order to find the impact of working capital management on profitability, we have used the multiple regression analysis using panel data. We used eight models to find out the impact of cash conversion cycle and its components on the ROA and ROE without and with taking into consideration the checks under collections and deferred checks.

**Table 3: Estimation results**

Variables	Model 1 ROA	Model 2 ROA	Model 3 ROA	Model 4 ROA	Model 5 ROE	Model 6 ROE	Model 7 ROE	Model 8 ROE
<b>Leverage</b>	-0.0483*** (0.0089)	-0.0449*** (0.0087)	-0.0461*** (0.0105)	-0.0474*** (0.0103)	-0.0494*** (0.0131)	-0.0440*** (0.0129)	-0.0391** (0.0154)	-0.0406*** (0.0155)
<b>Size</b>	0.0225*** (0.0016)	0.0224*** (0.0016)	0.0214*** (0.0016)	0.0225*** (0.0017)	0.0393*** (0.0026)	0.0390*** (0.0026)	0.0368*** (0.0025)	0.0383*** (0.0027)
<b>ACCCwo</b>	0.0084*** (0.0024)				0.0118*** (0.0033)			
<b>ACCCwc</b>		0.0101*** (0.0024)				0.0140*** (0.0032)		
<b>ACPwo</b>			0.0039 (0.0045)				-0.0024 (0.0046)	
<b>APPwo</b>			-0.0112* (0.0064)				-0.0223** (0.0086)	
<b>ITOwo</b>			0.0133*** (0.0035)				0.0249*** (0.0054)	
<b>ACPwc</b>				0.0100** (0.0044)				0.0068 (0.0046)
<b>APPwc</b>				-0.0065 (0.0055)				-0.0147* (0.0077)
<b>ITO</b>				0.0117*** (0.0039)				0.0246*** (0.0061)
<b>Constant</b>	-0.2907*** (0.0249)	-0.2913*** (0.0249)	-0.2745*** (0.0245)	-0.2946*** (0.0255)	-0.5383*** (0.0393)	-0.5375*** (0.0397)	-0.5021*** (0.0374)	-0.5306*** (0.0402)
<b>Observations</b>	183	183	183	183	183	183	183	183
<b>R-Squared</b>	0.584	0.586	0.576	0.590	0.626	0.617	0.673	0.646

Model 1 that we have estimated was as follows:

$$ROA_{it} = \alpha + \beta_1 ACCCwo_{it} + \beta_2 LEVERAGE_{it} + \beta_3 SIZE_{it} + et.$$

Model 2 was as follows:

$$ROA_{it} = \alpha + \beta_1 ACCCwc_{it} + \beta_2 LEVERAGE_{it} + \beta_3 SIZE_{it} + et$$

Model 5 that have been applied was as follows:

$$ROE_{it} = \alpha + \beta_1 ACCC_{woit} + \beta_2 LEVERAGE_{it} + \beta_3 SIZE_{it} + et.$$

Model 6 that have been applied was as follows:

$$ROE_{it} = \alpha + \beta_1 ACCC_{wcit} + \beta_2 LEVERAGE_{it} + \beta_3 SIZE_{it} + et.$$

The first model fits well in terms of R square (.58) as well as F (83.921) and Durbin-Watson (1.54). The coefficient of ACCC is (.01) and it is significant at 1%. The second model fits well in terms of R square (.609) as well as F (84.472) and Durbin-Watson (1.72). The coefficient of ACCC is (.010) and it is significant at 1%. The fifth model fits well in terms of R square (.625) as well as F (99.68) and Durbin-Watson (1.6325). The coefficient of ACCCwc (.01) and it is significant at 1%. The sixth model fits well in terms of R square (.617) as well as F (96.208) and Durbin-Watson (1.635). The coefficient of ACCCwc (.014) and it is significant at 1%.

Models 1, 2, 5, and 6 indicate that the cash conversion cycle affects the profitability positively. This is contrary to the findings of Raheman et al. (2007), Ramachandran et al. (2009), Bieniasz et al. (2011) and Vural et al. (2012), but consistent with Sharma et al. (2011), Abuzayed (2012), and Shah et al. (2018).

Next, we have investigated the effect of the components of cash conversion cycle (ACP, APP, and ITO) on profitability. In Model 3, we have estimated the following:

$$ROA_{it} = \alpha + \beta_1 ACP_{woit} + \beta_2 APP_{woit} + \beta_3 ITO_{it} + \beta_4 LEVERAGE_{it} + \beta_5 SIZE_{it} + et.$$

Model 4 was as follows:

$$ROA_{it} = \alpha + \beta_1 ACP_{wcit} + \beta_2 APP_{wcit} + \beta_3 ITO_{it} + \beta_4 LEVERAGE_{it} + \beta_5 SIZE_{it} + et.$$

Model 7 that we have applied was as follows:

$$ROE_{it} = \alpha + \beta_1 ACP_{woit} + \beta_2 APP_{woit} + \beta_3 ITO_{it} + \beta_4 LEVERAGE_{it} + \beta_5 SIZE_{it} + et.$$

and Model 8 that we have applied was as follows:

$$ROE_{it} = \alpha + \beta_1 ACP_{wcit} + \beta_2 APP_{wcit} + \beta_3 ITO_{it} + \beta_4 LEVERAGE_{it} + \beta_5 SIZE_{it} + et.$$

The third model fits well in terms of R square (.575) as well as F (48.017) and Durbin-Watson (1.518). The coefficient of ACPwo is (.003) and it is insignificant which means that the average collection period does not affect the profitability of the industrial firms in Palestine while the average payment period have negative effect and inventory turnover have positive effect on the profitability of industrial firms. The fourth model fits well in terms of R square (.5897) as well as F (50.898) and Durbin-Watson (1.527). The coefficient of ACPwc (.01) and it is significant at 5% which means that the average collection period affect the profitability positively and the inventory turnover has a coefficient of (.011) and significant at 5%. The average payment period

has insignificant coefficient indicating no relationship between average payment period with deferred checks and the profitability of industrial firms.

The seventh model fits very well in terms of R square (.6729) as well as F (72.823) and Durbin-Watson (1.603). and the coefficient of ACPwo (-0.002) and it is insignificant at 10% which means that the average collection period does not affect the profitability of industrial firms where the average payment period have a negative relationship with the profitability and the inventory turnover has a coefficient of (0.024) and it is significant at 1%. The eighth model fits very well in terms of R square (.6461) as well as F (64.641) and Durbin-Watson (1.623). and the coefficient of ACPwc (0.0067) and it is insignificant at 10% which means that the average collection period does not affect the profitability of industrial firms where the average payment period have a negative relationship with the profitability and the inventory turnover has a coefficient of (0.024) and it is significant at 1%.

In general ACCC, ACP, and ITO have positive relationships with profitability and APP has negative relationship with profitability. The two control variables were significant in all models. The size variable is positive and the leverage variable is negative in all models consistent with past literature. The results are consistent with Sharma et al. (2011), Abuzayed (2012), and Shah et al. (2018). On the other hand, some of our findings contradict with some earlier studies on the issue like Raheman et al. (2007), Ramachandran et al. (2009), Bieniasz et al. (2011) and Vural et al. (2012) whom found that the CCC has a negative effect on the profitability.

## **6. Conclusions**

This paper aimed to find the impact of working capital management on the financial performance of the Palestinian industrial corporations. On the basis of the findings of this research, the results indicated that cash conversion cycle has a positive and statistically significant effect on the financial performance. The average collection period and the inventory turnover in days both have positive effects on profitability as well. The average payment period has negative effect in most models. The long period for cash conversion cycle which takes firms more than seven months on average to convert raw materials into cash, explains high amount of working capital in Palestinian firms. Thus, improving the cash conversion cycle would have positive effect on firms' profitability.

The small industrial sector and the small economy limited our ability to generalized results. There is much research to be done about working capital in Palestine in the future. Since there are few results that are in contradiction to some of the earlier studies, future research could further explore the reasons for this contradiction. Moreover, further research can be conducted on the same topic with different sectors and extending the years of the sample. Exploiting the time dimension of the data with new econometrics methods is another suggestion for future research.

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## **Appendix 1**

### **Firms in Research Sample for the period 2002 to 2018**

	<b>Company Name</b>
1	Arab Company For Paints Product (APC)
2	Palestine Poultry (AZIZA)
3	Beit Jala Pharmaceutical (BJP)
4	Birzeit Pharmaceuticals (BPC)
5	AlShark Electrode (ELECTRODE)
6	Golden Wheat Mills (GMC)
7	Jerusalem Cigarette (JCC)
8	Jerusalem Pharmaceuticals (JPH)
9	National Aluminum and Profile (NAPCO)
10	Palestine Plastic Industries (LADAEN)
11	The National Carton Industry (NCI)
12	Dar Al-Shifa Pharmaceuticals (PHARMACARE)
13	The Vegetable Oil Industries (VOIC)