The Determinants of Working Capital Requirements in Palestinian Industrial Corporations

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Abstract

This study is trying to find the variables that determine working capital for Palestinian industrial firms. We used a sample of 11 industrial firms that are listed on the Palestine Securities Exchange. We used Working Capital as the endogenous variable, and some financial and economic variables, such as cash conversion cycle, operating cash flow, leverage, firm size, return on assets, interest rate on loans, and economic growth rate, as exogenous variables.

An econometric model was established and parameters were estimated based on the panel data for 11-industrial companies for eight years (2004-2011). The study found that the cash conversion cycle, return on assets and operating cash flow are a significant determinant and positively related to the working capital requirements, while leverage and firm size are significant but negatively related to the working capital requirements. On the other hand economic variables such as: the interest rate and real GDP growth rate has no significant impact on the working capital. These findings are consistent with several previous studies, for other countries such as Jordan, Brazil, Pakistan, India, Greece, Thailand, Cyprus and Sri Lanka. In addition, it was found that Palestinians firms maintain a sizable working capital which may be due to a long cash conversion cycle (over six months) and to conservative policies due to instable economic and political conditions.

Keywords: working capital, cash conversion cycle, operating cash flow, leverage, return on assets, economic growth

1. Introduction

Managing the financial needs and operations of any business is very important to the management of the company, because it has an effect on both profits and liquid assets of the firm. Financial needs are largely classified into two types of needs: working capital needs and fixed capital needs. That part of finance which enables an enterprise to conduct its day-to-day operations is called working capital. We need to analyze short term assets and liabilities carefully in order to manage the firm's liquidity, management of working capital helps managers to manage their operation of the firm through making available cash to pay for short-term debt and the maturity of long term debt as well as expenses resulting for daily operations. So, an optimal level of working capital must be kept to trade off between return and risk (Ranjith, 2008).

One of the integral components of the overall corporate strategy is to manage working capital efficiency. This needs to control short term obligation as well as decrease investment in liquid assets as much as possible in order to create shareholder value (Eljelly 2004). In practice, Narender, Menon and Shewtha, (2009) show that a firm may lose several profitable investment opportunities or suffer a liquidity problem if the working capital is too low or it is improperly managed.

While a number of previous research studies have examined the effects of the working capital on the profitability, efficiency, performance and earning before interest rate and tax (EBIT). (e.g. Nobanee, 2009; Padachi, 2006; Rahman and Nasr, 2007; Ramachandran and Janakiraman, 2009; Shin and Soenen, 1998; Wu, 2001), this subject is still a very important issue because it affects the short term investment decisions; and managers can increase the value of the firm by reducing the working capital ratio to its optimal level (Rahman and Nasr 2007).

Even though several studies about working capital management were undertaken, in both developed and under developed countries; this study adds to the literature by examining the issue of the working capital management

and its determinants in developing markets. In specific it examines the variables that affect the working capital requirements in Palestinian industrial firms, given that little attention was given to the money those firms make in short term assets. To the best of our knowledge, there is only one study about working capital in Palestinian companies which studied the effect of working capital on their stock prices (Awad and Al-Ewesat 2012).

The aim of this paper is to find the important variables that affect the size of the working capital in Palestinian firms. We are going to test the following variables: the cash conversion cycle, operating cash flow, returns on asset, firm size, debt leverage, economic growth rate, and interest rate on loans. A sample of 11 Palestinian industrial firms has been chosen. The data covers 8-years period 2004-2011 of those companies listed on the Palestinian Security Exchange (PSE). The industrial sector in Palestine is important to the Palestinian economy, because it is considered a major source of employment and economic growth. So finding the determinants of working capital requirements in Palestinian industrial sector is important for the firms to be able to understand the factors that contribute to improving their profitability and value. It is helpful to both firms' managers and economic policy makers.

This research article is planned as follows. Section II is a summary of the literature review. Section III discusses the sample and the variables. Section IV presents the data analysis. Section V deals with the regression analysis and Section VI summarizes the findings and conclusion.

2. Literature Review

Sagan (1955) showed that the working capital management has a vital effect on the health of the firm. Moreever it is still one of the most important issues that affect the short term investment decisions; the working capital management process needs very important decisions regarding cash required for investing the optimal level of inventories, and managing credit and debt account (Darun 2008). In this context Eljelly (2004) mentioned that the business's history and its type, determine its requirements for working capital. The cash gaps and the working capital differ from one industry to another; whereas some maintain short-term, or even negative cash gaps, because of their ability to obtain a large amount of credit from their suppliers. .

The literature itself indicates several factors that affect working capital management and they change over time. Hawawini, Viallet andVora (1986) in their study suggested that working capital policies are dependent on industry practices and concluded that its effect on working capital management is stable over time. Working capital policies differ from one industry to another, because the inventory requirements are different from one industry to another and even from firm to another in the same industry. Service industries need no inventory, while manufacturing need a large amount of inventory.

Filbeck, and Krueger (2005) and Yadav, Kamath and Manjreka (2009) in their studies concluded that working capital policy is dynamic over time, because it varies with economic cycles. Therefore in times of high business volatility, companies tend to use a large amount of working capital, and to adopt an aggressive approach in times of low volatility. Some studies showed that when there are more fluctuations in future cash flow the cash held and short term investment of a company will increase, so managing operating cash flow will have a significant effect on a company's working capital management such as Ranjith's (2008) study on Thailand firms.

The liquidity position of the firms also depends mainly upon the size of inventory, but other components, like debtors, loans and advances cash and bank balance, and bills receivable etc., are also responsible (Singh, 2008). In this context the results of Hill, Kelly, and Highfield. (2009) showed that the working capital ratio is negatively related to the rate of growth in sales, unexpected demand, rate of interest, and financial difficulties; and it is positively related to operating cash flow and capital market access.

Moussawi, Laplante and Kieschnick (2006) in their study focused on some factors that may influence working capital management such as the size of the firm, growth rate of sales, the percentage of outside directors on board, the compensation of executives, directors, and the percentage share of the CEO. They found that the inefficiency of a firm's working capital management is correlated with the size of the firm but not correlated with its industry concentration. They also found that the higher the proportion of outsiders of a firms board, the better performance of its working capital management. The higher the compensation of the CEO's, the better the firms' working capital management. However, the larger the CEO's share of the firm's stock, the contrary behavior is shown. These results are consistence with Hawawini et. al. (1986) results that there is a substantial industry effect on the firms working capital management practices and this effect is stable over time and that sales growth and industry practices are important factors, which influence a firm's investment in working capital.

In order to find out if the managers can determine the working capital, Frankel (2005) agrees with the above findings and showed that managers respond to working capital performance incentives. Thus, managers' concern

about the level of working capital, because compensation committees and investors; emphasize the minimization of non-cash working capital. He provided evidence that managers are striving to improve operating cash flow.

Pandey and Perera (1977) studied the working capital management policy and practices of private sector manufacturing companies in Sri Lanka, they found that the size of the firm is one of the major influences of working capital policy and approach. Many previous studies insured that the size is one of the determinants of the working capital requirements. Padachi (2006) in his study on small industrial firms in Mauritania concluded that even the working capital represents a concern of all firms; the small firms and the large firms, but it is more important to small firms because, they tend to have a relatively high level of current assets, less liquidity, volatile cash flows, and a high reliance on short term debt. The work of Howorth and Westhead (2003), on management of working capital on small U.K. firms, suggested that small firms tend to put emphasis on some areas of working capital management where they can increase their returns and   improve their business performance.

In analyzing the determinants of working capital management, Chiou and Cheng (2006), found that there is an inverse relationship between capital structure of the firm and the two measures of liquidity: net liquid balance and working capital ratio. However variables such as business indicator, industry effect, growth opportunity, firm performance and the firm's size proved to have no effect on working capital.

Seeger, Locker and Jergen (2011), analyzed the working capital in the Swiss Chemical and Pharmaceutical industry. They analyzed 18 companies listed on the six Swiss Exchanges and compared them with their European and American competitors. They found that there was a huge potential for improvement especially in the area of managing short term assets and liabilities. in the Swiss industries.

With regard to the effect of working capital on the profitability, several studies have tackled the issue. The most important are: Rahman and Nasr (2007) who studied the effect of managing working capital on the firm's profitability in Pakistani companies. They used data during 1999-2004 for 94 companies listed on the Islamabad Stock Exchange. They used several variables such as: Average Collection Period, Cash Conversion Cycle, Average Payment Period, Inventory Turnover, and Net Operating Profitability. They found a strong relationship between working capital and a firm's profitability, and that cash conversion cycle can improve shareholders equity if the firm reduces it to an optimal level. Taghizadah, Akbari and Ebrati. (2012) studied the impact of working capital management policies on Iranian firm's profitability and value. They found that conservative investment policies and aggressive financing policy and leverage has a negative impact on firm's profitability and value; while firm size and firm growth has a positive impact.

There are three studies on Jordanian firms who examined the impact of working capital on firm's profitability and value. The first by Al-Mwalla (2012) she used Tobin's Q as a measure of Value and ROA as a measure of profitability. She found that a conservative investment policy has a positive impact on firm's profitability and value; while aggressive financing policy has a negative impact on both value and profitability. On the other hand she found that leverage has no effect on firm's profitability and value; while firm's size, sales growth and economic growth has a positive impact on both value and profitability. Al-Debie (2011) on the other hand, found that profitability increased with size and GDP growth, and decreased with leverage. He also found that Jordanian industrial companies invest significantly in working capital, so efficient working capital management can improve profitability of these firms. The third study by Hayajneh and Yassine (2011), on the same subject, found adverse relationship between profitability of the firm and the average receivable collection period, average conversion inventory period, average payment period, leverage, and cash conversion cycle. On the other hand they found a positive relationship between profitability and the firm's size, sales growth rate, and current ratio.

Nazir and Afza (2009) in their study on Pakistani firms used internal and external factors that have an effect on working capital; internal factors they used: operating cycle, operating cash flows, leverage, size, return on assets, Tobin's Q and growth rate, and they used the industry dummy and level of economic activity as external macroeconomic factors. They found a significant effect of operating cycle, leverage, return on assets and Tobin's Q on the working capital requirements.

3. Sample and Variables

3.1 Sample

In this study, we investigate the factors that affect the working capital requirements of Palestinian industrial firms. Our study sample consists of all industrial firms listed on the Palestine Securities Exchange (PSE). We included firms listed before 2004 and should neither have been delisted by the PSE nor merged with any other firm during the study period. Furthermore, firms must have a complete data for the period 2004-2011. The required financial data has been obtained from the annual reports of these firms from the website of the PSE. The

final sample was 11 industrial firms, and so the total of 88 observations are included in the analysis. This number is large enough to arrive at some meaningful statistical results. Moreover, the fact that this number accounts for about one-fourth of all listed companies, one can argue that the results are a good approximation of the Palestinian market**.**

3.2 Variables Description

3.2.1 The Dependent Variable

Working Capital Ratio (WCR). The study will try to find the determinants of working capital requirements of the industrial firms, so we have included the working capital deflated by total assets as a dependent variable and is measured by:

$$WCR= (current\ assets\text{-}\ current\ liabilities)/\ total\ assets$$

3.2.2 The Independent Variables

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

1. Cash Conversion Cycle (CCC), cash conversion cycle is defined as the number of days needed to convert its purchases from raw materials to finished product and sell it for cash. The longer the cash conversion cycle, the greater the net investment in current assets, and hence the greater the need for financing of current assets, and it is calculated by:

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

Since most of the variables in our model are in ratios we divided the number by 365 so we get the number per year instead of days (annual cash conversion cycle).

$$ACCC=CCC/365$$

2. Operating Cash Flow (OCF), is the cash the firm will obtain from its routine operations. We get it from the income statement then it is deflated by total assets. Positive operating cash flow enables firms to finance positive working capital requirements allowing a more conservative operating working capital strategy, thereby facilitating future sales growth; however firms with negative operating cash flows must finance positive working capital requirements through other sources (Ranjith 2008), (Hill et.al. 2010). It is calculated by:

$$OCF=(EBIT + Depreciation – Taxes)/Total\ Assets$$

3. Firm Size (Size), Pendey and Perera (1977), and Moussawi (2006) verify that the size of the company has an influence on the overall working capital policy and approach. They used the natural logarithm of total assets of the firm. Some other studies used log of sales as size measure (Deloof 2003). Other studies used the rate of growth of sales, but we prefer to use the log of total assets, because most of our firms have more than 50% of the total market share as there are few firms in each industry.

$$SIZE=Log\ (Total\ Assets)$$

4. Profitability, there are several indicators of profitability such as; ROE and ROA. Most studies prefer to use ROA to find the efficiency of management in generating profits from the firm's assets**.** It is calculated by dividing a company's net income by its total assets,

$$ROA= Net\ Income/\ Total\ Assets$$

5. Leverage (LEV) which is the financial debt ratio that is used in order to establish the relation between the external financing of the firm and its total assets**.** According to the Pecking Order Theory, a company with short funds will tend to raise capital from inside before issuing new stocks or borrowing money from outside, since raising capital via new securities will have issuing costs besides more outside monitoring and limitations. Narendre et,al. (2009) found that a higher debt ratio is due to less capital available for daily operations, so the firm may have to raise capital from outside in response to a lack of funding, plus exercise caution in working capital management so as not to aggravate the shortage of funds. Nazir and Afza (2009) also used the leverage ratio as an independent variable in their study to determine the factors that affect working capital management in Pakistan. This variable can be measured through the following equation:

$$LEV= (Short\ Term\ Loans+ Long\ Term\ Loans)/Total\ assets$$

6. Real GDP Growth Rate (GDPR) Economic growth is probably one of the most reliable economic indicators, it is the best measure of changes in economic activities. The changes in economic conditions may have an effect on managing the firm more efficiently. Lamberson (1995) stated that small firms respond differently in working capital management to changes in economic activities. The working capital policy is not static over time; it

varies with the changes in the state of the economy. Rate of growth of GDPR is used as an indicator of economic growth.

7. Interest Rate on Loans and Advances(R) which is the cost of borrowing money. Filbeck and Kruger (2005) observed that the changes in interest rates has an effect on working capital management, because firms have less desire to make payments early when interest rate increase, this will stretch account payable.

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

Variable	Mean	Std. Deviation	Min.	Max.	N
WCR	.2744	.23176	-.208	735	88
LEV	.2822	.18688	.025	324	88
OCF	.0696	.0542	0.039	.2577	88
R	8.4113	.71771	7.447	9.183	88
GDPR	6.9287	4.38280	-5.2	10.42	88
ACCC	.4874	.26553	.084	105	88
SIZE	6.9907	.41690	.125	605	88
ROA	.0402	.06583	-.114	228	88

The working capital requirements variable has a mean value 27.44% of total assets i.e about $2 million with a standard deviation of .23. The positive and high values of working capital indicate that companies are maintaining relatively conservative policies for managing their working capital.

The average of the cash conversion cycle is .4874 year, this means that the average number of days that working capital is invested in the operating cycle is 178 days (about one-half of a year), where the standard deviation is 99 days. This is also long relative to industrial countries which are 1-3 months only.

The operating cash flow ratio has a mean value .0696, less than 7% of total assets the standard deviation is .0542. To check the size of the firm and its effects on the working capital management, natural logarithm of assets is used. The mean value of the size is 6.99 while the standard deviation is .42. Translate this into values; we got the mean of total assets JD 9.77 million and standard deviation of JD 2.6 million.

In the same way the average profitability measured by ROA for Palestinian firms is 4.02% with a standard deviation of .066 which is higher than industrial firms in industrial countries.

The results of the statistical analysis show that the average debt ratio (which equals to
Total Debt /total Assets) for the Palestinian companies is .2822 with a standard deviation of .187, this ratio is low compared to firms in industrial countries. This is due to the conservative policies Palestinian firms use in their leverage.

In the same context we checked the interest rate and the real GDP growth rate. The interest rate has a mean of 8.4% with a standard deviation of 0.72; While GDP growth rate mean is 6.9% with a standard deviation of 4.4.these ratios are high relative to both industrial and less developed countries.

4.2 Correlation Analysis

Table 2 shows the Pearson correlation coefficient between the different variables of the model and the significant ratio using two tail tests.

Table 2. Pearson correlation coefficient

	WCR	LEV	R	ACCC	GDPR	OCF	SIZE	ROA
WCR	1							
LEV	-.567**	1						
R	0.038	0.137	1					
ACCC	.392**	-.420**	-0.077	1				
GDPR	0.046	-0.047	-.355**	0.163	1			
OCF	0.171	-0.032	-0.092	.282**	0.099	1		
SIZE	-.326**	0.191	-0.105	0.142	0.039	.698**	1	
ROA	.255*	0.037	-0.063	0.092	-0.01	.400**	0.198	1

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

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

The table above shows that working capital is positively correlated with cash conversion cycle (.392) significant at 1% level and profitability of the firm measured by ROA (.255) and is significant at 5% levels. This means that the more profitable firms are more able to manage the working capital. It can also be said that the better the firm manages its working capital the more profitable the firm will be. This is consistent with the findings of Al Debie (2011) on Jordanian companies. On the other hand, leverage is highly significant but negatively correlated with working capital (.567). These results are consistent with (Rehman, 2007) results.

The company size is positively correlated with operating cash flow (.698) and significant at 1% level which is consistent with the theory and with the other studies. The larger the firm the higher it's OCF. An interesting result shows a negative correlation between the size of the firm and working capital (.326), this may be due to the power over their suppliers to get credit on their purchases.

5. Regression Analysis

In order to find the most important variables that have an effect on working capital, we have used the multiple regression analysis, using time-series and cross-sectional observations. We used two models to find out the important variables that have an effect on working capital.

5.1 Model One

In this model we include all variables that might have an effect on working capital of Palestinian firms. The model that we have applied is as follows:

$$WCR_{it}=\alpha+\beta_1 LEV_{it}+\beta_2 OCF_{it}+\beta_3 WCR1_{it}+\beta_4 R_{it}+\beta_5 GDPR_{it}+\beta_6 ACCC_{it}+\beta_7 SIZE_{it}+\beta_8 ROA_{it}+ e_t.$$

Where the variables as discussed earlier and (i) and (t) represent the firm and the year respectively. We used 11 firms and 8 years (2004-2011). β_1- β_8 are the coefficients of the exogenous variables. We used the Ordinary Least Square method of estimation and we got the following results:

Table 3. Coefficients[a]

| Model | Unstandardized Coefficients | | Standardized Coefficients | | | Correlations | | |
	B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part
1 (Constant)	1.132	.396		2.856	.005			
LEV	-.360	.077	-.290	-4.645	.000	-.567	-.463	-.243
OCF	3.490E-8	.000	.211	2.023	.046	.171	.222	.106
WCRt-1	.493	.067	.500	7.401	.000	.783	.640	.388
R	.019	.019	.058	1.013	.314	.038	.113	.053
GDPR	.002	.003	.036	.633	.529	.046	.071	.033
ACCC	.061	.055	.070	1.106	.272	.392	.123	.058
SIZE	-.166	.051	-.298	-3.238	.002	-.326	-.342	-.170
ROA	.603	.263	.171	2.292	.025	.369	.250	.120

a. Dependent Variable: WCR

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.885[a]	.783	.761	.11323	1.731

a. Predictors: (Constant), LEV, OCF, WCRt-1, R, GDPR, ACCC, SIZE, ROA

b. Dependent Variable: WCR

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	3.660	8	.458	35.686	.000[a]
	Residual	1.013	79	.013		
	Total	4.673	87			

a. Predictors: (Constant), LEV, OCF, WCRt-1, R, GDPR, ACCC, SIZE, ROA

b. Dependent Variable: WCR

So the model results will be:

$$WCR = 1.132 - .29LEV + .211OCF + .5WCRt\text{-}1 + .058R + .036GDPR + .07ACCC - .298\,SIZE + .171ROA$$

$$(2.856)\quad(4.645)\quad(2.023)\quad(7.4)\quad(1.013)\quad(.633)\quad(1.106)\quad(-3.238)\quad(2.292)$$

Where values in parenthesis represent (t) statistics. R square = .783, F=35.7, DW= 1.731

In general the model fits very well in terms of R square (.783) as well as F (35.7) and Durbin-Watson (1.73). We have no autocorrelation if calculated D is more than DU (from the table 1.63), Durbin (1970). Since the calculated D is 1.731. So we accept the null hypothesis of $\rho = 0$, we have no autocorrelation

Taking all variables into consideration we found limited support for a direct correlation between working capital and interest rate, rate of economic growth, and operating cash flow. As with regard to regression analysis, the first two as well cash conversion cycle proved to be not significant at 5% level. This is contrary to the findings of Narender et al. (2009), but consistent with Lamberson (1995), Chiou and Cheng (2006), Nazir and Afza (2009), and Ranjith (2008) .

We used the ROA as a proxy for profitability; it shows a significant positive relationship with the dependent variable, which means that the firms with higher profits are less concerned with the efficient working capital. And this is consistent with Nazir and Afza's (2009) results, as well as Mahomet and Eda (2009) and Wu (2001) who showed that there is a positive relationship between return on assets and the working capital requirements.

Leverage of the firms is significantly and negatively correlated to the working capital management of the firm it has a *t* value of 4.6. This indicates that the higher the leverage the more attention has to be paid by the firms to reduce capital that is tied to current assets. So companies with high leverage show lower working capital requirements. That is in accordance with the Pecking Order theory, and is consistent with Nazir and Afza (2009) results on Pakistani firms, Chiou, Cheng and Wu (2006) on Taiwan companies listed on Taiwan Stock Exchange, and Nakamura et al. (2007) on Brazilian firms listed on the Sao Paulo Stock Exchange.

Operating cash is positively significant, which implies that Palestinian firms have enough cash from operation activities to finance their working capital. These findings are consistent with Ranjith (2008) and Hill et al. (2009).

Finally, the size of the firm has a negative and significant effect on working capital. The larger the firm the less working capital to total assets is required. Large firms may require larger investment in working capital because of larger volume of revenues or because they use their market power to force relationship with suppliers and get a reduction in payment term (Mousawi et al. 2006). But here we found that larger firms require lower investment in working capital which may be due to their power over suppliers and thus can have longer period for their payables.

5.2 Model Two

Excluding Outside Variables: Interest Rate, Economic Growth. This reduces the model to become

$$WCRit=\alpha+\beta_1 LEV_{it}+\beta_2 OCF_{it}+\beta_3 ROA_{it}+\beta_4 CCC_{it}+\beta_5 SIZE_{it}+et$$

The results of the regression are as follows:

Table 4. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients				Correlations		
		B	Std. Error	Beta		t	Sig.	Zero-order	Partial	Part
1	(Constant)	2.640	.389			6.792	.000			
	LEV	-.431	.097	-.348		-4.427	.000	-.567	-.439	-.300
	OCF	6.459E-8	.000	.391		2.974	.004	.171	.312	.201
	ACCC	.156	.068	.178		2.281	.025	.392	.244	.154
	SIZE	-.347	.058	-.624		-5.943	.000	-.326	-.549	-.402
	ROA	.828	.335	.235		2.471	.016	.369	.263	.167

a. Dependent Variable: WCR

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.883[a]	.780	.764	.11261	1.714

ANOVA[b]

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.646	6	.608	47.915	.000[a]
	Residual	1.027	SIZE 81	.013		
	Total	4.673	87			

a. Predictors: (Constant), LEV, OCF ACCC, SIZE, ROA

b. Dependent Variable: WCR

The equation will become:

$$WCR=2.64 - .348LEV + .391OCF + .235ROA + .178ACCC - .624SIZE$$
$$(6.792) (-4.427) \quad (2.974) \quad (2.471) \quad (2.281) \quad (-5.943)$$

Numbers in parenthesis are for t values.

The model fits very well in terms of R square (.78), F(47.9) and Durbin Watson(1.714)with all variables are significant at the 1% level (as T is more than two for all five exogenous variables), and with the right signs. Contrary to what we found in the first model, Cash conversion cycle becomes significant, operating cash flow and profitability, measured by return on assets have a positive impact on the working capital; while leverages and size of the firm have a negative impact, as we have discussed in the first model. These variables explain about 78%of the change in working capital and have the right signs. These findings are consistent with the results found by Lazaridis and Tryfonidis (2006) for firms listed on the Athens Stock Exchange and with Charitou, Elfani and Lois. (2010) for firms listed on the Cyprus Stock Exchange, and with Al-Debie (2011) on Jordan firms in terms of leverage but disagree with him in terms of firms' size. It also agrees with most of the findings of Hayagneh and Yassine (2011) for Jordanian firms.

6. Conclusions

This paper tries to find the variables that determine the amount of working capital that the Palestinian firms hold. On the basis of the findings of the research, out of seven examined explanatory variables- cash conversion cycle, operating cash flow, size of the firm, return on assets, debt ratio (leverage), interest rate and real GDP growth

rate, the first five variables are found statistically significant determinants of working capital requirements for Palestinian firms. The last two are found not significant, this is clear from the second estimation without interest rate and real GDP growth rate, which indicates that limited support for a direct correlation between working capital and economic factors. Beta coefficients associated with all of them are statistically significant at 1% level and have the right sign. These variables explain more than three-fourths of the variation in working capital. So, it can be concluded that the listed companies in Palestine change their working capital requirements based on the total assets, leverage, operating cash flow, return on assets and cash conversion cycle.

We may further conclude that the firms can improve their profitability if they manage these factors in a more efficient way. In addition working capital is not affected by the economic variables, such as economic cycle and interest rate. Another interesting finding is the long period for cash conversion cycle which takes firms about six months on average to convert raw materials into cash which explains the high amount of working capital Palestinian firms maintain. Thus improving the cash conversion cycle and increase leverage would have positive effect on firms' profitability. Working capital requirements of 27% of total assets is very high which may be due to limited capital market access for external financing capabilities and due to unstable economic and political conditions.

The above results are consistent with earlier studies of Lamberson (1996), Wu (2001), Chiou and Cheng (2006), Mahomet and Eda (2009), and Nazir and Afza (2009) on Pakistan, Lazaridis and Tryfonidis (2006) on Greece, Nakamura et al.(2003) on Brazil, Ranjth (2008) on Thailand firms, Pendey and Parera (1977) on SriLanka, Al-Mwalla, Muna (2012), and Hayagneh and Yassin (2011) on Jordan. On the other hand, some of our findings contradict with some earlier studies on the issue like Narender et al (2009) who found that the size has a positive effect on working capital in the cement industry in India, and Al-Muwalla (2012) in Jordan who found that leverage and firm size have a positive impact on both value and profit.

There is much to be done about working capital in Palestine in the future, because this phenomenon may be attributed to the developing market of the Palestinian Security Exchange. 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 firms and extending the years of the sample. Future research could be also conducted on the same topic for other countries so that working capital management policies can be compared between developing and developed countries in order to improve firm's management, and their profitability and value.

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