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Working capital management and corporate performance: evidence from Iranian companies

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Abstract

The present research studies the effect of working capital management over the performance of firms Listed in Tehran Stock Exchange (TSE). Average Collection Period, Inventory Turnover in days, Average Payment Period, Cash Conversion Cycle, and Net Trading Cycle were used to assess working capital management, and Net Operating Profitability was used to assess firms' performance. The findings of studying 50 different companies during the time period between 2006 and 2009 by using a multi-regression model showed that there is a negative and significant relationship between the variables of Average Collection Period, Inventory Turnover in day, Average Payment Period, Net Trading Cycle and the performance of firms Listed in Tehran Stock Exchange (TSE). There were no evidences to prove the existence of a significant relationship between Cash Conversion Cycle and the company's performances (NOP). The results showed that the increase in Collection Period, Payment Period, and Net Trading will lead towards the reduction of profitability in the company. In other words, managers can increase the profitability of their companies reasonably, by reducing Collection Period, Inventory Turnover, and Payment Period.

Keywords: Working Capital Management, Net Operating Profitability, Average Collection Period, Inventory Turnover in Days, Average Payment Period.

1. Introduction

Financial management was posed as one of the subcategories of management courses since 1900 and gradually its importance became more evident because most of the decision-makings were based on the information collected by this field, Raymond, P.(2001). Now describes financial management as follows: "It is managing the resources and consumption of the capital in such a way that maximizes the stockholders' wealth". Financial management is divided into more specialized subcategories in which working capital management's role is highly important and it is called managing current assets and current liabilities of the company. Working capital and cash are imagined to be the blood current in the vessels of a business entity in order to save the survival of the business entity and management of this part is claimed to be the beating heart of a business entity which pumps up the blood into the vessels of the organization. Experiences have shown that one of the main reasons for financial disturbances and bankruptcies in

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most companies is the mismanagement of working capital (Setayesh, 2009).The reasons of the importance of working capital management in Iranian companies are as follows:

1) Most Iranian companies prefer to change cash into other assets because of inflation and the reduction in purchase power of the money and this leads to shortage of cash when the time comes to clear liabilities and this result in the disturbances the credibility of the organization.
2) The shortage of working capital in most companies which face financial disturbances leads to bankruptcy and this is one of the main reasons for importance of working capital.
3) The investors are looking for investments which lead towards the highest stock yields and the investors should be assured of the present situation and this assurance should be achieved with consulting and programming to enlighten the route towards a clear investment. Here the investor encounters with two questions; how much and where the capital should be invested, and how the capital should be directed in long-term. To achieve this goal, the company needs to devise a strategy to identify the market's future, regarding the present situation (Jahankhani & Talebi, 1999).

In the present research which has been done in financial management field, we have tried to use the concepts and theories of financial management and library studies to recognize and identify the relationship between working capital management and the performance of companies Listed in Tehran Stock Exchange.

2. Literature Review

Most of the empirical studies support the traditional belief about working capital and profitability that reducing working capital investment would positively affect the profitability of firm (aggressive policy) by reducing proportion of current assets in total assets.

Deloof (2003) analyzed a sample of Belgian firms, and Wang (2002) analyzed a sample of Japanese and Taiwanese firms, emphasized that the way the working capital is managed has a significant impact on the profitability of firms and increase in profitability by reducing number of day’s accounts receivable and reducing inventories.

Padachi (2006) has examined the trends in working capital management and its impact on firm’s performance for 58 Mauritian small manufacturing firms during 1998 to 2003. He explained that a well designed and implemented working capital management is expected to contribute positively to the creation of firm’s value. The results indicated that high investment in inventories and receivables is associated with low profitability and also showed an increasing trend in the short term component of working capital financing.

Raheman and Nasr (2007) studied the relationship between working capital management and corporate profitability for 94 firms listed on Karachi Stock Exchange using static measure of liquidity and ongoing operating measure of working capital management during 1999-2004. The findings of study suggested that there exist a negative relation between working capital management measures and profitability

Sen. M (2009) examined the ISE (Istanbul Stock Exchange) listed firms and checked out the relationship with the working capital. According to them there is negative relationship among variables. His research uncovered the importance of the finance directors who act as moderators or catalysts to increase the productivity of the firm in other words they positively affect the firm’s performance

Dong (2010) reported that the firms’ profitability and liquidity are affected by working capital management in his analysis. Pooled data are selected for carrying out the research for the era of 2006-2008 for assessing the companies listed in stock market of Vietnam. He focused on the variables that include profitability, conversion cycle and its related elements and the relationship that exists between them. From his research it was found that the relationships among these variables are strongly negative. This denote that decrease in the profitability occur due to increase in cash conversion cycle. It is also found that if the number of days of account receivable and inventories are diminished then the profitability will increase numbers of days of accounts receivable and inventories.

3. Methodology

The present research focuses on the measuring-discovering method of correlation in which regression is used to analyze the results (a curve which connects all the distributions). The resulted curve is regression and the equation is called regression equation. In order to test the hypotheses and analyze quantities, two methods were used in this research. First Pearson's correlation model was used to measure the relationship between the variables of working capital management and profitability. Then regression analysis will be used to estimate the cause and effect relationship between the variables of profitability and working capital management. Also by using identification coefficient (R^2), the amount of changes of dependent variable compared with the independent variables will be assessed. In this research, Student statistics (t) will be used to study the correctness of testing research hypotheses and Fisher's statistics (F) will be used to investigate the appropriateness of the model.

3.1. The Objectives and Hypothesis of the Research: This research objectives and hypothesis is:

- Studying the impact of working capital management (cash conversion cycle) on firm’s performance during 2006-2009.
- Studying the impact of different components of cash conversion cycle on the performance of the companies.

For these objectives, we formulate the following hypotheses and will attempt to find statistical evidences to support the hypotheses.

Hypothesis 1: There is a negative significant relationship between ACP and NOP.

Hypothesis 2: There is a negative significant relationship between ITID and NOP.

Hypothesis 3: There is a negative significant relationship between APP and NOP.

Hypothesis 4: There is a negative significant relationship between CCC and NOP.

Hypothesis 5: There is a negative significant relationship between NTC and NOP.

3.2. Statistical society and the time period of the research:

The companies under our investigation belong to medicine and cement industries. The total number of companies in these industries is 62, through which 50 were appropriate to be investigated in our research project. The time period for our research was 4 years and the companies' financial statements data of 2006 to 2009 were extracted to do so.

All the companies were accepted in Tehran Stock Exchange. The companies should meet the following requirements.

- The end of financial year should be the end of Esfand.
- The companies should not be investing and financial.
- The data should be accessible.

3.3. Measuring the research variables

3.3.1. **Dependent variable:** several criteria have been utilized to measure and assess the profitability of a business entity in accounting studies and researches and in this research the operating profitability has been used as the profitability criterion and it was extracted from the income statement. This variable has been recognized as the dependent variable of the research.

3.3.2. **Independent variables:** in this research 5 features such as Average Collection Period**,** Inventory Turnover in Days**,** Average Payment Period**,** Cash Conversion Cycle**,** and Net Trading Cycle have been investigated as the independent variables of working capital management.

3.3.3. **Controlling variables:** in this research and based on the researches carried out by Deloof (2003), Lazaridis and Tryfonidis (2006), Raheman and Nasr (2007), the variables of Company's size, Sales Growth, Financial Debt to Total Assets Ratio, and Financial Liabilities to Total Assets Ratio which were supposed to affect the research results were considered to be controlling variables.

The calculation of each of variables is shown as follows:

Table 1: Measurement of Variables and Abbreviation

Variable	**Measurement**	**Abbreviation**
Net Operating Profitability	(Earning before Interest and Tax + Depreciation) / Total Assets	NOP
	Accounts Receivable / Net Sales*365	
Average Collection Period	Inventory / Cost of Goods Sold*365	ACP
Inventory Turnover in Days	Accounts Payable / Purchases*365	ITID
Average Payment Period	ACP +ITID – APP	APP
Cash Conversion Cycle	ACP+ (Inventory / Net Sales*365) - (Accounts Payables /	CCC
Net Trading Cycle	Purchases*365)	NTC
	Net sales / Current Asset	
Gross Working Capital Turnover Ratio		GWCTR
Current Assets to Total Assets Ratio	Current assets to Total assets	
Current Liabilities to Total Assets Ratio	Current Liabilities / Total assets	CATAR
Financial Debt Ratio		CLTAR
Size of firm using Log of Sales	Total Financial Debt / Total Assets	
Sales Growth	Natural Logarithm of Sales	FDR
	(Current year N. sales-Last year N. Sales) / Last year's N. Sales	LOS
	Current Assets / Current Liabilities	SG
Current Ratio		CR

4. Statistical analysis

The results of different criteria of working capital and companies' performance including: Average Collection Period**,** Inventory Turnover in Days**,** Average Payment Period**,** Cash Conversion Cycle**,** and Net Trading Cycle have been shown below. First parts deal with coefficient correlation analysis and Second part statistical testing related to the variables.

4.1. Correlation Analysis

Correlation matrix of all variables included in the analysis is presented in Table 3 which is calculated based on data of 50 firms from 2006-2009. The table shows that Operating Profitability is negatively associated with measures of working capital management (Average Collection Period, inventory turnover in days, Average Payment Period, Cash Conversion Cycle and Net Trade Cycle).

Table 2: Pearson Correlation coefficients between Variables

	NOP	ACP	ITID	APP	CCC	NTC
NOP	1					
Sig. (2-tailed)						
ACP	-.162	1				
Sig. (2-tailed)	(.028)					
ITID	-.269	-.103	1			
Sig. (2-tailed)	(.000)	(.166)				
APP	-.334	.057	.270	1		
Sig. (2-tailed)	(.000)	(.439)	(.000)			
CCC	-.046	.327	.302	-.606	1	
Sig. (2-tailed)	(.532)	(.000)	(.000)	(.000)		
NTC	-.197	.327	.055	-.418	.768	
Sig. (2-tailed)	(.007)	(.000)	(.458)	(.000)	(.000)	1

The correlation coefficients for most measures of working capital management are significant. These results are consistent with the view that making payment to suppliers, collecting payments form customers earlier and keeping product or inventory in the stock for lesser time are associated with increase in profitability. A negative relation between Average Payment Period and Net Operating Profitability suggests that less profitable firms wait longer to pay their accounts payables. These three variables jointly form Cash Conversion Cycle and there exists negative relationship between CCC and operating profitability but it is not significant. It might not be a surprise because all the three components of CCC has negative association with the profitability and Average Payment Period is subtracted from sum of ACP and ITID to form Cash Conversion Cycle. Similar result was found for study conducted by Deloof (2003) for Belgian firms. Another measure of working capital management is the Net Trade Cycle which has also a significant negative relationship with profitability. It implies that if a firm is able to reduce the Net Trade Cycle period, it can enhance the profitability for the firm and will ultimately create value for the shareholders.

4.2. Findings resulted from Hypotheses testing:

Table 3 shows that the significant level of ACP, ITID, APP and NTC in model 1,2,3,5 respectively, is (P = 004, .002, .006, .035 <.05). Testing the hypotheses showed that there is a significant negative relationship between Average Collection Period, InventoryTurnover in Days, Average Payment Period, Net Trading Cycleand Net Operating Profitability. In fact this shows that if collection period, Inventory Turnover, Payment Period and Net Trading Cycle increases, the company's net operating profitability will reduce and vice versa. The summaries of the statistical testing are shown below:

$\Delta\mathbf{Y}$: shows net operating profitability changes; $\Delta\mathbf{x_1}$: shows average collection period changes;$\Delta\mathbf{x_2}$: shows gross working capital turnover ratio; $\Delta\mathbf{x_3}$: shows financial debt ratio; $\Delta\mathbf{x_4}$: shows sales growth; and finally, $\Delta\mathbf{x_5}$: shows current ratio.

Regarding the controlling variables of Current Assets to Total Assets Ratio, Current Liabilities to Total Assets Ratio, Company's size and the constant amount, the null hypotheses of the related tests were accepted because the significant level of these variables are greater than %5, and thus they are placed out of regression equation.

The final model of the first, second, third and fifth hypotheses testing are as follows:

$$\Delta Y_1 = -.162\Delta x_1 + .090\Delta x_2 - .134\Delta x_3 + .031\ \Delta x_4 + .145\Delta x_5$$

$$\Delta Y_2 = -.120\Delta x_1 + .094\Delta x_2 - .125\Delta x_3 + .031\Delta x_4 + .168\Delta x_5$$

$$\Delta Y_3 = -7.331\Delta x_1 + .092\Delta x_2 - .155\Delta x_3 + .036\Delta x_4 + .149\Delta x_5$$

$$\Delta Y_5 = -6.225\Delta x_1 + .091\Delta x_2 - .131\Delta x_3 + .031\Delta x_4 + .161\Delta x_5$$

In Model 4, the significant level of cash conversion period is shown as (P = .157 > .05). In fact it shows that there is not any significant relationship between cash conversion period and net operating profitability. Thus, the 4th hypothesis is rejected.

Table 3: Impact of Working Capital Management on Corporate Performance – OLS Estimation (2006-2009)

Dependent Variable	Net Operating Profitability				
Models	1	2	3	4	5
	ACP	ITID	APP	CCC	NTC
Constant	-.180	-.082	-.089	-.138	-.082
	(.119)	(.477)	(.443)	(.236)	(.457)
LOS	.026	.010	.014	.016	.007
	(.133)	(.504)	(.420)	(.364)	(.670)
FDR	-.134	-.125	-.155	-.131	-.131
	(.000)	(.000)	(.000)	(.000)	(.000)
CATAR	.102	.007	.036	.046	.041
	(.154)	(.924)	(.596)	(.509)	(.549)
CLTAR	-.005	.019	-.001	.000	.011
	(.947)	(.806)	(.987)	.993	.886
GWCTR	.090	.094	.092	.096	.091
	(.000)	(.000)	(.000)	(.000)	(.000)
SG	.031	.031	.036	.032	.031
	(.002)	(.002)	(.000)	(.002)	(.002)
CR	.145	.168	.149	.161	.161
	(.000)	(.000)	(.000)	(.000)	(.000)
ACP	-.162	-	-	-	-
	(.004)	-	-	-	-
ITID	-	-.120	-	-	-
	-	(.002)	-	-	-
APP	-	-	-7.331	-	-
	-	-	(.006)	-	-

CCC	-	-	-	-.057	-
	-	-	-	(.157)	-
NTC	-	-	-	-	-6.225
	-	-	-	-	(.003)
R-Square	.765	.767	.765	.757	.767
Adjusted R-Square	.755	.756	.754	.746	.756
Durbin-Watson Stat	1.915	1.847	1.896	1.909	1.932
F-statistics	71.377	71.996	71.031	68.136	71.846
Prob(F-statistic)	.000	.000	.000	.000	.000

5. Conclusion

In this research have studied the effect of different variables of working capital management including the Average collection period, Inventory turnover in days, Average payment period, Cash conversion cycle, Net Trade Cycle, on the Net operating profitability of Iranian Companies and Current ratio, financial leverage, sales growth, Current Assets to Total Assets Ratio, Current Liabilities to Total Assets Ratio , Gross Working Capital Turnover Ratio and size of the firm (measured in terms of natural logarithm of sales) have been used as control variables.

The table shows that Operating Profitability is negatively associated with measures of working capital management (Average Collection Period, inventory turnover in days, Average Payment Period, Cash Conversion Cycle and Net Trade Cycle). The correlation coefficients for all measures of working capital management are significant except for Cash Conversion Cycle. These three variables jointly form Cash Conversion Cycle and there exists negative relationship between CCC and operating profitability but it is not significant. It might not be a surprise because all the three components of CCC has negative association with the profitability and Average Payment Period is subtracted from sum of ACP and ITID to form Cash Conversion Cycle. It means that as the average collection period, inventory turnover in days, Net Trading Cycle and Average payment period increases it will lead to decreasing profitability of the firm, and managers can create a positive value for the shareholders by reducing the, average collection period, inventory turnover in days, Net Trading Cycle and Average payment period to a possible minimum level.

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