Effect of Working Capital Management on the Profitability of Listed Companies in Tehran Stock Exchange

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ABSTRACT: In the current challenging economic and environment increasing pressure and limited external resources, current assets and liabilities, that is to say, working capital of the economic enterprises is of great importance. Working capital optimal management of the economic enterprises can be considered as a competitive advantage for them. The main goal of this paper is to investigate the relationship between working capital management and profitability of listed companies in Tehran Stock Exchange. Research data was analyzed using population of 116 listed companies in Tehran Stock Exchange for the period of 2006-2011 by applying combination method of all data (pooled data) and ordinary least squares regression (OLS). The research results indicate that, there is a significant inverse relationship between cash conversion cycle and its components, including the collection period, inventory turnover period and accounts payable turnover period, and profitability of the firms. Corporate managers can increase the profitability of their company desirably by reducing the collection period and inventory turnover period.
Key words: Liquidity Cycle, Profitability, Working Capital

INTRODUCTION

Regard to the importance and the station of investment in the organizational processes, its management is essential. Meanwhile, working capital generally, in all organizations allocated a large part of the organization capital. Based on the mechanisms of the supply chain elements management, its management is of great importance. Working capital management is the optimal combination of working capital items in a manner that maximizes shareholder wealth [1].

The most important evaluation criterion in the working capital is cash conversion cycle. Cash conversion cycle is the time between the purchase of raw material and collection of the proceeds from the sale of manufactured goods. The longer is this duration, the more investment in working capital is required. Longer cash conversion cycle might increase profitability through increased sales. However, if the investment costs in working capital exceed the benefits of investment in assets or more granting of business credit, the firm's profitability may be reduced [2]. One of the components of working capital management is the collection. In general, the principal goal of the firms' managers is the increase of firm value. In this regard, receivable accounts management can be effective in achieving this goal. Increase in receivable accounts in a company will lead to an increase in working capital as well as an increase in costs of receivable accounts management and maintenance. Generally, the collection period is a criterion for the measurement of the required time for cash collection from customers' sales.

Inventory turnover period is another component of working capital management. Inventory turnover period indicates the length of time it takes for goods to be sold. Low-frequency circulation means relatively high investment in inventory. Maintaining goods more than the necessary level will result in financial resources detention in non-productive cases [2]. Another component of working capital management is the accounts payable turnover period. Delays in payments to suppliers of goods and materials allow the Company to choose the quality of their purchased product. Also, this is a cheap and flexible source of financing for the company. On the other hand, if earlier payment of the statements is included in discount, the delay in payment of statements will involve expenses for the company [2].

So, regarding to the above issues, in this study the effect of working capital management indexes on the financial performance of listed companies in Tehran Stock Exchange was examined.

A review on research literature

Liquidity and profitability are today's most important issues of corporations. Addressing these subjects is one of the needs of society and industry in the country. Working capital management is one of the strategies for the companies to achieve the desired liquidity. So that desired liquidity for the companies is maintained to the extent that they do not confront excess abnormal liquidity or unnatural lack of liquidity.

Working capital management plays a vital role in the management structure of an organization. Thus, in some cases, working capital and liquidity argument is likening to the blood which flows in the arteries of a business unit, so that the business unit can survive. And management of this entity is likening to the business unit heart that is responsible for pumping blood into the arteries of the organization [3].

Given the importance of the issue, in the following, some conducted researches within and outside the country are cited. Fathi and Tavakoli [4] examined the relationship between working capital management and financial performance and have concluded that there is a significant association between the decrease of the collection duration, the duration of the inventory maintenance, and as a result the shorter liquidity cycle, and the profitability of the companies. The companies can achieve high profitability by holding the liquidity cycle in an optimal level. Mohammadi [5] in his study titled "Effects of working capital management on the profitability of listed companies in Tehran Stock Exchange" investigated 92 companies between the years 1996 to 2005. In this study, the variable of "gross profit to total asset ratio" was applied as a measure of corporate profitability and the variables of collection period, inventory turnover period, the accounts payable turnover period and cash conversion cycle were used as working capital criteria. The results suggest that there is a significant inverse relationship between the profitability of companies and collection period, inventory turnover period, the accounts payable turnover period and cash conversion cycle. Yaghoobnejad [6], in a study examined the relationship between working capital management and profitability among the 86 companies during the period 1381-1388. Results showed that there is an inverse relationship between the variables of working capital management and profitability. Lazaridis et al. [7] in a study investigated the relationship between corporate profitability and working capital management in the Athens Stock Exchange, during the years 2001 to 2004 using data from 131 companies. The results showed that there is a significant relationship between profitability and cash conversion cycle. Padachi [3] in his study on "the effects of working capital management on corporate performance and profitability," showed a significant relationship between cash conversion cycle and return on assets. This study examined the various components of the cash conversion cycle. The results indicate that the issue of working capital management is very important in large companies. In a survey conducted by Ancuest et al. [8] the effect of working capital management on profitability during 1990 to 2008 in Finland stock Exchange was examined. The results showed that there is an inverse relationship between the cycle of cash, receivable accounts collection period and inventory turnover period, and profitability; and there is a direct relationship between the cycle of cash, receivable accounts collection period and inventory turnover period, and accounts payable turnover period .

MATERIAL AND METHODS

Research Hypotheses

First hypothesis: There is a significant relationship between liquidity cycles and financial performance; **Second hypothesis:** There is a significant relationship between collection period and financial performance; **Third hypothesis:** There is a significant relationship between the inventory turnover period and financial performance; **Fourth hypothesis:** There is a significant relationship between accounts payable payment period and financial performance.

Research variables

Dependent variable: Profitability is considered as one of the most important indicators to evaluate the company's financial performance. It is calculated using criteria such as return on assets ratio and the ratio of operating income to non-monetary assets. In this study, just like Padachy [3] and Mohammadi [5] researches, the ratio of net income to total assets is used [9].

$$ROA = \frac{NETearning_{it}}{ASSETS_{it}}$$

The independent variables

Liquidity cycle: Liquidity cycle is considered as the principal component of working capital management, which involves the collection period, inventory holding period and period of paying the accounts payable. Liquidity cycle = collection period + inventory holding days number - period of paying the accounts payable.

Collection Period: Collection period is equal to the average number of days a company takes to collect receivables from customers. Collection period = (Debtors/ Sale) * 365.

Inventory holding period: The inventory holding period is calculated from the following equation, and represents the average number of days inventory is hold by the company [3].

Inventory holding period = (Inventories / purchases)*365.

Period of paying the accounts payable: Period of paying the accounts payable represents the average treatment duration of the company's debts with its suppliers. It is calculated by the following equation [3]. Period of paying the accounts payable= (accounts payable/purchases)*365.

Control variables

Current Ratio: Current Ratio is obtained from current assets divided by current liabilities and represents the ratio of current assets to current liabilities. The larger this ratio is, the more power company's liquidity has.

$$CR = \frac{currentASSETS_{it}}{currentDEBT_{it}}$$

Financial Leverage: The total amount that is supplied from liabilities is calculated by this ratio. It is obtained from the total liabilities divided by the total assets. This ratio indicates how much of the company's assets are supplied by debt and how much is financed through capital.

Firm Size: To determine the firm size various criteria are used, including: the logarithm of the total value of assets, total sales, number of employees, market value of equity. In this study the logarithm of the total value of assets is applied.

The models used to test the hypothesis: To test the research hypotheses the following two models will be used:

$$FP_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CR_{it} + \beta_3 DEBT_{it} + \beta_4 \log SALE + \varepsilon_{it}$$

$$FP_{it} = \beta_0 + \beta_1 AR_{it} + \beta_2 INVENT_{it} + \beta_3 AP_{it} + \beta_4 CR_{it} + \beta_5 DEBT_{it} + \beta_6 \log SALE + \varepsilon_{it}$$

In which:

FP: financial performance (return on assets), CCC: cash conversion cycle, AR: Collection period, INVENT: inventory holding period, AP: Accounts payable paying period, CR: current ratio, DEBT: financial leverage, SALE: logarithm of sales, ε: is the disturbance.

Research Method and population

This research is a practical research and it is in the field of PAT research using multiple regression method and is done by econometric modeling. To investigate whether there is correlation between the variables or not, the statistic of the Durbin - Watson is used. Statistical analyses are done through 7 EViews software. To test the research hypotheses Ordinary Least Squares (OLS) method is used. Population of this Study is the listed companies in Tehran Stock Exchange from the beginning of 2006 until the end of 2011, a period of 6 years, which have retained their membership in the Exchange during this period. Moreover, the population is adjusted using the following conditions:

1. The company should be listed before the year 2006 and its stock be traded on an exchange from the beginning of 2006.

2. End of the company's fiscal year should be March as well as, not having any change in the fiscal year during the course of the study.

3. During the course of the study, i.e. years from 2006 to 2011, the Company should have no interruption in the Stock Exchange trading more than three months.

4. After applying these limits, 116 companies had all the conditions for presenting in the population.

RESULTS

In order to achieve the objective of the study which was the examination of the impact of working capital management on the profitability of listed companies in Tehran Stock Exchange, the research results are obtained as follows: First hypothesis examines the relationship between liquidity cycle and financial performance of companies in Tehran Stock Exchange: In this hypothesis, the dependent variable is financial performance, and independent variable is liquidity cycle. Test the significance of the coefficients is what the researcher is looking for. The significance test of the coefficients is what the researcher tries to determine. In addition to determining the significance of the coefficients, this test determines the effect direction of these coefficients on the dependent variable. The related statistics to determine significance of the coefficients is the t-statistic. The research model test results and t statistic of the first hypothesis is shown in the table number 1. This table results indicate that the p-value statistic amount for the variable of the first hypothesis, that's to say, the liquidity cycle is 0.0001. Regard to the fact that the error level for this study is considered 0.05, thus, the liquidity cycle variable has significant influence on financial performance, and the first research hypothesis is confirmed at the 99% confidence level. The coefficient of the independent variable, i.e. liquidity cycle, is negative. As a result, there is a direct and negative relationship between financial performance and liquidity cycle. In other words, by increasing the liquidity cycle, profitability will be reduced.

As noted in Table 1, the F -statistic is significant at the 99% confidence level. Thus, the research model was significant and independent variables and control variables are able to explain dependent variable. In addition, the adjusted coefficient of determination obtained from the model test was 0.62. This figure shows that approximately 0.62% of the variability of dependent variable, that is, the financial performance results from the independent and control variables which exist in the model and the other 0.38% of variability results from other factors. Furthermore, the observed values of the statistic Durbin - Watson confirmed that there is no correlation between disruption components of the model, since these values are in the 1.5 to 2.5intervals. According to the results of testing the research model, the coefficients of the research model will be as the following equation:

$$FP_{it} = -7.9 - 2.21 CCC_{it} + 0.05 DEBT_{IT} + 1.43 SIZE + 0.63 CR + \varepsilon_{it}$$

Table 1. Test results of the first hypothesis

Description	Coefficient	t-static	p-value	R-squared	Adjusted R-squared	F-static	p-value
Intercept	-7.9	-4.60	0.000	0.68	0.62	12.62	0.000
CCC	-2.21	-4.67	0.000				
DEBT	0.05	0.23	0.8				
SIZE	1.43	4.76	0.000				
CR	0.63	1.93	0.05				
Durbin-Watson					2.14		

Test results of liquidity cycle components hypothesis

 The second research model significance test results which have investigated the relationship between liquidity cycle components and financial performance by combined analysis of data in Table 2 is as follows. The F-statistic is significant at the 99% confidence level. Thus, the research model was significant and independent variables and control variables are able to explain dependent variable. In addition, the adjusted coefficient of determination obtained from the model test was 0.78. This figure shows that approximately 0.78 % of the variability of dependent variable, that is, the financial performance results from the independent and control variables which exist in the model and the other 0.22 % of variability results from other factors. According to the results of testing the research model, the coefficients of the research model will be as the following equation:

$$FP_{it} = -5.845 - 75_1 AR_{it} - 3.371 NVENT - 7.21 AP + 0.14.DEBT_{it} + 1.19 SIZE_{it} + 0.45 CR_{IT} + \varepsilon_{it}$$

Table 2. Test results of the research model in compound data level

Description	Coefficient	t-static	p-value	R-squared	Adjusted R-squared	F-static	p-value
Intercept	-5.84	-3.29	0.001				
AR	-5.75	11.1	0.000				
INVENR	-3.37	4	0.000				
AP	-7.21	2.68	0.04	0.798	0.787	26.555	0.000
DEBT	0.14	0.6	0.5				
SIZE	1.19	3.96	0.000				
CR	0.45	1.46	0.14				
Durbin-Watson					2.325		
Observation Number					696		

Research hypotheses test results are described separately below:

The second hypothesis examined the relationship between the collection period and the financial performance of companies in Tehran Stock Exchange: In this hypothesis, the dependent variable is financial performance and the independent variable is the collection period. Research model test results and t-statistics states that the p-value statistic amount for the variable of the second hypothesis, that's to say, collection period is 0.000. Regard to the fact that the error level for this study is considered 0.05, thus, collection period variable has significant influence on profitability, and the second research hypothesis is confirmed at the 99% confidence level.

The third hypothesis examined the relationship between the inventory holding period and the financial performance: In this hypothesis, the dependent variable is financial performance and the independent variable is the inventory holding period. Research model test results and t-statistics states that the p-value statistic amount for the variable of the third hypothesis, that's to say, inventory holding period is 0.000, thus, inventory holding period variable has significant influence on profitability, and the third research hypothesis is confirmed at the 99% confidence level.

The forth hypothesis examined the relationship between period of paying the accounts payable and the financial performance: In this hypothesis, the dependent variable is financial performance and the independent variable is period of paying the accounts payable. Research model test results and t-statistics states that the p-value statistic amount for the variable of the forth hypothesis, that's to say, period of paying the accounts payable is 0.04, thus, period of paying the accounts payable variable has significant influence on profitability, and is confirmed at the 95% confidence level. The coefficient of each three independent variable included collection period, inventory holding period and period of paying the accounts payable is negative. As a result, there is a direct inverse relationship between these variables and financial performance. In other words, with increase of collection period, inventory holding period and period of paying the accounts payable, profitability is reduced. The results of the research hypotheses accord with Fathi and Tavakoli [4], Mohammadi [5], Yaghoobnejad [6], Lazaridis and Turifonidis [7], Padachi [3], Ancuest et al. [8] test results.

DISCUSSION AND CONCLUSION

1. Based on the first, second, third hypotheses and their results it can be said that managers to some extent can cause a positive value and profitability for shareholders by reducing the cash conversion cycle, reducing the

collection period, and reducing inventory turnover period. This needs liquidity planning and appropriate managing of receipt and payments, inventory accurate management and appropriate utilization of investment opportunities and financing.

2. According to the fourth hypothesis and its results, it can be said that managers by reducing the period of paying debts as much as possible can cause a positive value and profitability for shareholders. This calls for proper handling of payments and using creditors' credit condition.

Study Recommendations
Recommendations for future researches topics

Naturally, the results of the present study are obtained from the available information and spatial and temporal constraints. It is recommended that the following researches be conducted to develop this study:

1. It is suggested that future researches be conducted independently on components of working capital management, particularly on cash management, securities traded in the market, accounts receivable and assets.

2. It is recommended that future researches investigate barriers to employ timed systems (JIT) in manufacturing units in Iran and its relation to working capital management.

Practical Recommendations

1. Organizations should identify affecting factors on working capital and organization working capital policies and through careful consideration of these factors improve organization working capital performance.

2. To achieve optimal working capital management, organizations should keep their liquidity cycle in an optimal extent by proper management of the supply chain forward part, including collection period and inventory holding period and also by proper management of supply chain backward part the which includes accounts payable payment period.

3. Contrary to the general impression that consider the delay in payment of accounts payable as a positive step towards improving the performance and profitability, companies to achieve profitability should keep their accounts payable payment period at its optimal minimum and use proper credit policies for customers and their suppliers.

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