Investigate the Effect of Working Capital and Cash Holdings on Profitability of Companies Listed in the Tehran Stock Exchange

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Abstract: The aim of present research is investigate the relationship between financial variables of working capital, Cash holdings and profitability. In this research, average of collection period, average of inventory turnover duration, average of debt payment period and free cash flow of the firm are independent variables and return on assets and return on capital are dependent variables. Also, Firm size and financial leverage are control variables. With regard to the research subject, statistical population of present research includes listed companies in Tehran Stock Exchange. In this research, selected samples were 77 companies. Data of this research has been collected by using the companies listed in Tehran Stock Exchange from the beginning of 2009 to the end of 2014. In this research, to test the hypothesis was used multiple regression analysis with the method of mixed data with the fixed effects. Research results indicated that there is a significant relationship between working capital and cash holdings and return on assets. Also, there is a significant relationship between working capital and return on capital.

Key words: working capital, Cash holdings and profitability, return on assets, return on capital.

Introduction

In recent years, many companies have faced with poor liquidity and examine the factors associated with this condition is important. Efficient working capital management is as an important aspect of financial management practices in all known forms of organization. Existence of extensive literature show that working capital management directly will affect on the liquidity and profitability. The possibility of bankruptcy increases for companies that exposed to inappropriate management of working capital. Working capital management deals with current and liabilities. Current assets of companies constitutes a significant portion of total assets. Excessive levels of current assets can lead to the realization of return on investment less than the standard limit. However, companies with the levels of little current assets will have the problem and shortages in the ordinary process of operations, and problems. Efficient working capital management includes planning and control of current assets and liabilities in such a way that resolve the risk of inability to fulfill the short-term obligations and avoidance of excessive investment in current assets (Rahman and Naser, 2007).

The importance of working capital originate from the fact that level of working capital is effective on profitability and acceptable risk level and ultimately value of the company. The recent liquidity crisis has highlighted the importance of managing and controlling the working capital. Managers have to control the balance between maximizing the profitability and liquidity to achieve the optimal working capital. Optimal working capital management should create the value for company positively. Empirical research in advanced economies of the world showed that efficient working capital management increases the company's market value a finally have a positive effect on value of equity (Sandy et al, 2012). With regard to the mentioned subjects, the aim of present research is investigate the effect of financial variables of working capital and cash holdings on profitability of listed companies in Tehran Stock Exchange.

Theatrical foundations

Working capital management is a concept that is usually seen in the corporate finance literature and this reflect its importance for the company (Aktas et al, 2014). Studies have indicated that a significant part of the investment in working capital is unnecessary. Ek and Guerin (2011) have argued that there is wide range to improve the efficiency of working capital management in the majority of firms. Ernst and Young (2012) concluded that amount of unnecessary and operational working capital for thousand American companies in 2011has been between 330 to

590 billion dollars (between 3 to 6 percent of their sales). Also, Buchmann et al (2008) emphasized that net power of operational working capital as a potential source of cash to increase the funds available to the company often will be ignored by companies.

Existing literature offer several theoretical arguments to understand the relationship between working capital and corporate performance. Thus, it is expected that additional investment has a positive effect on working capital especially for companies with a little working capital. The reason for this is that working capital allowed to companies for increasing the sales and profitability. On the other hand, additional investment in working capital can be a source of adverse effects and resulted in the destruction of shareholder value. The increase in working capital require the additional financing which in turn includes financing costs and opportunity (Kieschnick et al, 2013). Thus, companies with a large working capital in their balance sheets potentially are faced with the higher interest expense, risk and bankruptcy. Wang et al (2013) indicated that a decrease in net working capital of firm is required to increase its cash holdings. Thus, there is a replaced relationship between the Net working capital and cash holdings.

Research literature

Mun and Jang (2015) in research entitled "Working capital, cash holding, and profitability of restaurant firms" investigates the impact of restaurant firms' working capital on their profitability. This study reveals that a firm's cash level is an important factor for efficient working capital management. The results suggest that interactive effects exist among working capital, cash levels, and profitability.

Kroes and Manikas (2014) in research entitled " Cash flow management and manufacturing firm financial performance: A longitudinal perspective" concluded that changes in the widely used Cash Conversion Cycle (CCC) metric do not relate to changes in firm performance; however, changes in the less used Operating Cash Cycle (OCC) metric are found to be significantly associated with changes in Tobin's q.

Gomes (2013) in his research investigated the relationship between working capital management (WCM) and firm's profitability for Portugal for the period from 2004 to 2009. Results showed that there is a concave relationship between WCM and profitability, indicating that firms have an optimal working capital level where firms should stand to maximize profitability.

Yahyazadeh et al (2014) in research entitled "on the relationship between working capital and profitability in listed firms of Tehran Stock Exchange" investigated the relationship between working capital

and profitability in listed firms of Tehran Stock Exchange. The results showed that there is no nonlinear relationship between working capital and profitability. This shows no optimal level of capital flow in which the profitability is maximum. Furthermore, the results of research in automobile, chemical and non-metal minerals shows a nonlinear relationship between working capital and profitability.

Vaez et al (2013) investigated factors affecting on working capital management in Tehran Stock Exchange firms. The results of the study showed that there is a negative and significant relationship between profitability, leverage and capital expenditure with cash conversion cycle and there is a positive and significant relationship between GDP and the cash conversion cycle.

Baharmoghadam et al (2011) in research entitled "Surveying the effect of auditor type on the value relevance of earnings in the accepted company in Tehran Stock Exchange" investigated the effect of auditor type on the value relevance of earnings in accepted companies in Tehran Stock Exchange. The findings of this study indicated that there is a significant relationship operational efficiency in working capital management and profitability. Also, in regard to variables of control, liquidity and firm size, a significant positive relationship were found between these two variables and profitability.

Research Hypothesis

With regard to material presented in previous sections, the following hypotheses are proposed:

Main first hypotheses: There is a significant relationship between financial variables of working capital and cash holdings and return on assets.

1-1-   There is a significant relationship between firm working capital and return on assets.

1-2-   There is a significant relationship between cash holdings and return on assets.

Main second hypotheses: There is a significant relationship between financial variables of working capital and cash holdings and return on capital.

1-3-   There is a significant relationship between firm working capital and return on capital.

1-4-   There is a significant relationship between cash holdings and return on capital.

Methodology

The aim of present research is investigate the relationship between financial variables of working capital, Cash holdings and profitability. In this research, average of collection period, average of inventory turnover duration, average of debt payment period and free cash flow of the firm are independent variables and return on assets and return on capital are dependent variables. Also, Firm size and financial leverage are control variables. Because the present research results can be used in the decisions of

managers, investors, analysts and banking participants, the present research is applied with regard to the research aim. Also, with regard to the inference method about research hypotheses, the present research is descriptive-correlational because the regression and correlation techniques will be used to discover relations between research variables. To analyze and test hypotheses is used Eviews software. In each of the models fitted, several tests were also conducted.

Statistical population and sample

statistical population of present research includes listed companies in Tehran Stock Exchange. In this study, sample will be selected through the systematic elimination method of the statistical population that are 41 branches. In this research with regard to limited number of population companies, the sample has been based on the population. In this research, selected samples were 77 companies. Data of this research has been collected by using the companies listed in Tehran Stock Exchange from the beginning of 2009 to the end of 2014. In this research, to test the hypothesis was used multiple regression analysis with the method of mixed data with the fixed effects.

Research models and variables

Main first hypotheses: There is a significant relationship between financial variables of working capital and cash holdings and return on assets.

$ROA = \alpha_0 + \beta_1\ ACP + \beta_2\ ITID + \beta_3\ APP + \beta_4\ FCF + \beta_5\ Size + \beta_6\ FL + \mathcal{E}$

Main second hypotheses: There is a significant relationship between financial variables of working capital and cash holdings and return on capital.

$ROE = \alpha_0 + \beta_1\ ACP + \beta_2\ ITID + \beta_3\ APP + \beta_4\ FCF + \beta_5\ Size + \beta_6\ FL + \mathcal{E}$

In which:
ROA: return on assets
ROE: return on capital
ACP: average of collection period
ITID: Average of inventory turnover duration
APP: Average of debt payment period
FCF: Free cash flow of the firm
Size: firm size
FL: financial leverage

Research findings:
Descriptive statistics:

In table 1 has been mentioned Mean, Median (central criteria), standard deviation, maximum and minimum (dispersion parameters).

Table 1: Descriptive statistics of studied variables

Research variables	Mean	Middle	Max	Min	SD
ROA	0.61	0.06	67.74	-21.47	4.19
ROE	0.26	0.27	10.48	-16.04	1.22
ACP	150.53	117.93	1302.26	0	3.23
ITID	33.82	16.37	794.93	0	9.89
APP	66.86	43.2	575.46	0	9.13
FCF	0.22	0.13	1.85	-10.78	0.78
Size	13.84	13.68	18.45	10.08	1.49
FL	0.68	0.67	1.02	0.26	0.165

Inferential statistics
First model test

In order to estimation of the model coefficients related to research hypothesis test is used the Chow test and f Limer test to determine method of combined data. Based on the table 3, the result of Chow test show that F-statistic is less than 0.05.

Table 2: Chow test result

Null hypothesis	F statistic	Significance level	Chow test result
The use of combined data model	6.48	0.000	The null hypothesis is rejected

Table 3: Test results of main first hypotheses and its sub-hypotheses

Null hypothesis	Chi-square statistic	Significance level	Chow test result
The use of random effects model	139.278	0.000	The null hypothesis is rejected

With regard to the table 4, significant level of Hausman test is less than 5%. Thus, to estimate the mentioned model coefficients is used the fixed effects model.

Table 4: Test results of main first hypotheses and its sub-hypotheses

Variable	Significance level	t-statistic	Coefficients	standard error
Fixed value	0.000	-10.98	-30.91	2.81
ACP	0.000	-4.26	-0.53	0.014
ITID	0.0391	-2.27	-0.43	0.015
APP	0.000	-3.36	-1.02	0.021
FCF	0.0113	12.98	12.35	6.60
Size	0.0056	2.87	0.21	0.075
FL	0.0006	-3.45	-2.76	0.80
Determination coefficient	0.789	**F statistic**		17.28
justified determination coefficient	0.743	**Significance level of F statistic**		0.000
Durbin-Watson	1.82	**LS method**		

In above model, when β_1 and β_2 are significant, the first hypothesis is confirmed and when β_4 is significant, the second hypothesis is confirmed. With regard to table 4, because t-statistic for average of collection period, average of inventory turnover duration, average of debt payment period and free cash flow of the firm has been more than +1.965 and significant level is less than 0.05, thus, there is an inverse and significant relationship between average of collection period, average of inventory turnover duration, average of debt payment period and free cash flow and profitability of listed companies in Tehran Stock Exchange. Thus, the first hypothesis of this study is confirmed. Furthermore, there is a positive and significant relationship between free cash flow and profitability of listed companies in Tehran

Stock Exchange. In result, the second hypothesis of this study is confirmed.

Also, control variables of firm size have a positive relationship with profitability and Financial Leverage have an inverse relationship with profitability of listed companies in Tehran Stock Exchange (T-statistic is higher than 1.965 and significant level is less than 0.05).

Dorbin-Watson statistic of model is between 1.5 and 2.5. Also, significance level of F-statistic is 0.000 that is less than 0.05 and indicated that model is significant. Furthermore, the adjusted determination coefficient in the model is 74 percent that indicate 74 percent of changes in the dependent variable explained by the independent and control variables.
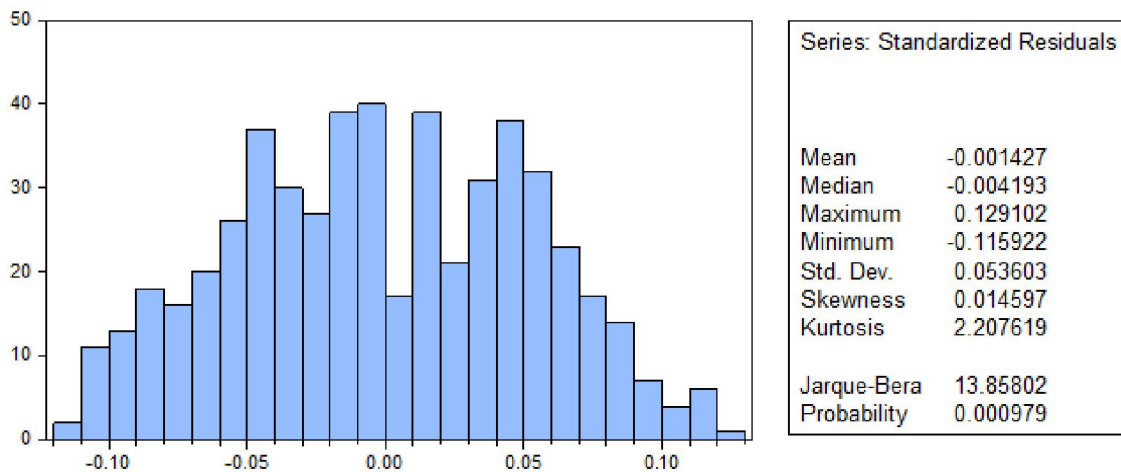

Mean	-0.001427
Median	-0.004193
Maximum	0.129102
Minimum	-0.115922
Std. Dev.	0.053603
Skewness	0.014597
Kurtosis	2.207619
Jarque-Bera	13.85802
Probability	0.000979

Fig 1: Scatter plot of residuals

Test results of main second hypotheses and its sub-hypotheses

Main second hypotheses: There is a significant relationship between financial variables of working capital and cash holdings and return on capital.

1-5-   There is a significant relationship between firm working capital and return on capital.

1-6-   There is a significant relationship between cash holdings and return on capital.

In order to estimation of the model coefficients related to research hypothesis test is used the Chow test and f Limer test to determine method of combined data. Results of test has been mentioned in the table 5.

Table 5: Chow test result

Null hypothesis	F statistic	Significance level	Chow test result
The use of combined data model	21.965	0.000	The null hypothesis is rejected

Table 6: Test results of main second hypotheses and its sub-hypotheses

Null hypothesis	Chi-square statistic	Significance level	Chow test result
The use of random effects model	109.981	0.000	The null hypothesis is rejected

With regard to the table 6, significant level of Hausman test is less than 5%. Thus, to estimate the mentioned model coefficients is used the fixed effects model.

Table 7: Test results of main second hypotheses and its sub-hypotheses

Variable	Significance level	t-statistic	Coefficients	standard error
Fixed value	0.000	5.09	0.543	0.106
ACP	0.000	4.42	0.0004	0.0001
ITID	0.000	-5.91	-0.002	0.0003
APP	0.000	-4.3	-1.001	0.0003
FCF	0.618	0.49	0.009	0.019
Size	0.039	-2.07	0.016	0.008
FL	0.699	0.39	0.046	0.118
Determination coefficient	0.42	**F statistic**		3.4
justified determination coefficient	0.30	**Significance level of F statistic**		0.000
Durbin-Watson	2.3	**LS method**		

In above model, when β_1 and β_3 are significant, the third sub-hypothesis is confirmed and when β_4 is significant, the fourth sub-hypothesis is confirmed. With regard to table 7, because t-statistic for average of collection period and average of debt payment period has been more than +1.965 and significant level is less than 0.05, thus, there is a significant relationship between average of collection period and Return on capital of listed companies in Tehran Stock Exchange. Thus, the third sub-hypothesis of this study is confirmed. Furthermore, there is not a significant relationship between free cash flow and return on capital of listed companies in Tehran Stock Exchange. In result, the fourth sub-hypothesis of this study is confirmed.

Dorbin-Watson statistic of model is between 1.5 and 2.5. Also, significance level of F-statistic is 0.000 that is less than 0.05 and indicated that model and second sub-hypothesis is significant. Furthermore, the adjusted determination coefficient in the model are significant.

Conclusions

In this study, research hypotheses were tested based on the collected data from 77 companies listed in Tehran Stock Exchange during the years from 2009 to 2014 by using the hybrid regression analysis. Initially, descriptive statistics was presented for the dependent, independent and control variables. Then, two main hypotheses were tested. Coefficients significant test results based on the fitted regression equations indicated that there is a negative and significant between working capital and profitability and there is a negative and significant between cash holdings and profitability and companies listed in Tehran Stock Exchange. Comparing the results of this study with similar studies is presented in three parts.

- There is a significant relationship between working capital management and cash holdings and profitability. The results of this research is consistent with studies of Rezazadeh and Heudarian (2010), Safari (2010), Ardakanian (2009), Ran (2012), Graham et al (2011), Gill et al (2010), Yar (2009), Padachi (2006), Delouf (2003). This researchers concluded that impact of working capital management on investigated companies' profitability is significant and negative. Conversion cycle to the cash as a measure of working capital management have a significant and negative on the working capital management. Components of conversion cycle to the cash which includes accounts receivable collection period, inventory turnover period and the period of delay in the payment of accounts payable have a significant and negative effect on companies' profitability. This means that companies can obtains a higher level of profitability with efficient management of inventories and shortening the collection period of accounts receivable. In addition, the suspension period of shorter payment increase the profitability of the company. Totally, research results indicated that efficient management of working capital and its components by companies have a significant effect on

companies' profitability. Also, results indicated that investment in working capital processes and efficiency of working capital management with usual routines is essential for companies' profitability. It's essential that companies considers working capital management in process of their financial planning. Studies results of Nasiri et al (2014) and Manouchehri (2013) showed that there is a significant relationship between companies' liquidity and profitability.

- There is a significant relationship between working capital management, cash holdings and return on assets. The results of this research is consistent with studies of Yazdani and Gholipour (2013), Baharmoghadam et al (2011). Man et al (2015). Yazdani and Gholipour (2013) indicated that cash conversion cycle have a significant and inverse relationship with the return on assets. Baharmoghadam et al (2011) showed that liquidity and firm size have a significant and positive relationship with the return on assets. Man et al (2015) indicated that there is interaction effects between liquidity and return on assets.

- There is a significant relationship between average debt collection period, cash holdings and return on capital. With regard to the significant relationship between average debt collection period, cash holdings and return on capital in Tehran Stock Exchange, some of results have adverse results with this study. The results of this research is consistent with research of Yazdani and Gholipour (2013). Yazdani and Gholipour (2013) concluded that cash conversion cycle has a significant and inverse relationship with the return on equity.

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