Evaluate The Relationship Between Risk Management and Working Capital Management in Companies Accepted in Tehran Stock Exchange During the Time Period of 2010-2015

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ABSTRACT

The aim of this study is to investigate the relationship between risk management and working capital management in companies accepted in Tehran Stock Exchange during the time period of 2010-2015. The sample includes total of 104 companies listed on the Tehran Stock Exchange. To test research hypothesis, risk management is considered as the independent variable, and working capital management is considered as the dependent variable. The results of panel data analysis showed that there is a significant inverse relationship between risk management and working capital indicators. That is, managers increase the level of investment in working capital to decrease the level of risk. Moreover, the results indicate that both operation working capital and liquid working capital is affected by risk management.

Introduction

The required funds for progressing daily commercial activities called the working capital. Working capital management includes an optimal combination of working capital items (that is, current assets and current liabilities) in a way that the wealth of shareholders will be maximized. Generally, working capital management related to daily activities and not related to the long-term decisions of a commercial unit. For example, access to raw materials, granting credit to customers and gathering due accounts, creating the advantage of credit

purchase, cash management account... . These factors will facilitate the daily operations of the commercial unit (Dianti Deylami et al, 2012). One of the most powerful criteria for assessing the quality of working capital management is cash conversion cycle. Cash conversion cycle refers to a period of time, in which cash funds consuming in the company's operating process to produce a product item (Mohammadi, 2009)

Risk can be defined as all types of events or circumstances that may prevent the organization from achieving its goals (Gordon et al., 2009). International Standards Organization defines the risk as a combination of the probability of an event and its effects. Thus, determining all potential risks in a process and the likelihood of their occurrence is the main part of an organization's risk assessment. Accordingly, Enterprise risk management (ERM) can be defined as an organized and continuous process throughout the organization for determination, assessment, decision making about the answer about opportunities and risks that can affect the achievement of the objectives. So, technically the risk can be either opportunity or danger (Jahanbani and Bagherpour, 2010)

Over the past few decades, significant changes have occurred in the role of risk management in the enterprises. Until the 1980s, the work of ERM commonly included insurance. During the 1990s and 2000s, the ERM was extended and included different types of risks including operational risk, credit risk and recent strategic risk. The main objective of risk management is maximizing the credit of shareholders. Enterprise risk management can help companies to reduce the cost of enterprise investment. According to mentioned contents, in this paper, we investigate the relationship between risk management and working capital management in companies accepted in Tehran Stock Exchange during the time period of 2010-2015. In fact, the following question arises: Is there any relationship between risk management and working capital management of companies? If the answer is yes, how are its type and impact?

Research Methods

This study tries to investigate the relationship between working capital management and risk management. The research sample include firms listed in Tehran Stock Exchange. The systematic method was used for sampling that applied measures to choose the sample are as following:

1) Companies listed in the main board of Tehran Stock Exchange

2) The companies must be accepted before 2010 in the Tehran Stock Exchange

3) The required information must be available from 2010 to 2015

4) The financial period must end to helical date, in order to consistency in reporting history and remove the seasonal effects

5) Banks and financial institutions (investment companies, financial intermediaries, holding, and leasing) are excluded from the sample

The final sample include 104 firms, and required research data are obtained from official website of Tehran Stock Exchange as well as special data software (Reh Award Nowin),

Research Variables

Independent Variable

Essinger (1991) defines risk management as an effective method for minimizing undesirable effects and in contrast maximizing obtained advantages from the effects of risk and Chapman (1997) knows the basic objective of risk management as improving the level of the performance process through the systematic identification of assessment and management risks related to project.

The independent variable is Risk Management. Risk Management is calculated by, dividing the standard deviation of annual net sales on the standard deviation of Return on Investments (ROI) and Return on Assets (ROA) separately, and during an average six years (Pourzamani and Karimi,2010).

The standard deviation of annual net sales is divided on SD of investment return and the return of assets of each company during six years and from the result of the division, we obtained logarithm due to large numbers and considered the result as an independent variable.

The Dependent Variable:

Working capital management is applied as dependent variable. Net Liquid Balance (NLB) and Cash Conversion Cycle (CCC) is selected as two indicators of working capital management.

Net Liquid Balance: is another indicator to determine the company's liquidity situation.in this index for indicating the company's liquidity situation, cash balance and securities are considered.This index shows the real liquidity store indices in related to unforeseen needs. The method of calculating the net liquidity balance is as follows (Shulman and Cox,1985):

$$NLB = \frac{CASH + MKT - AP}{TA}$$

In which,

NLB: Net Liquid Balance

Cash :liquidity

MKT: Marketable securities

PA: Payable papers

TA: total assets

Cash Conversion Cycle

Gitman,1647 referred to the Cash Conversion Cycle as a critical part of working capital management. Cash Conversion Cycle

 Is a net time period between pay debts and get cash from the collection of receivables. The shorter the period, the company has better liquidity. The formula to calculate the cash conversion cycle is as follows (again,1974):

CCC = OC - PP

Where,

OC is operation period that is calculated as follows:

OC = INVP + RP

Where,

RP: The period of recovering receivables

INVP: The maintenance period of goods inventory

PP: The period of payable accounts, calculated as follows:

PP=PA/DOGS

Which

PA: the remained of payable accounts

DCOGS: the cost of daily sold goods (COGS/360)

Control Variables

The reason for using control variables in this model is controlling the known and unknown causes in the relationship between dependent and independent variables (Scott et al, 2013)

Firm Size

Firm size has an impact on liquidity and working capital management because big companies have more bargaining power with their investors and customers in compare than small companies. for example, big companies can have negotiations with their suppliers to the value of discount and more period time for payment. Natural logarithm of firm assets is used as a index for firm size. (Dailof, 2003)

Profitability

Both profitability and liquidity are the core concerns of corporate managers. It is expected that profitability would have a great impact on the working capital management. A company with more investment in working capital may have more credit sales because gives long-term commercial credits to the customers (Deloof,2003). Lazaridis and Tryfonidis (2006) found that there is a negative relationship between the cash conversion cycle and evaluated profitability by operating gross profit. These researchers suggested that the shorter period length of cash conversion leads to more profit.

Return on Assets (ROA) is used as an index for profitability:

Return on Assets=$\frac{net\ profit(after\ tax\ deduction)}{total\ assets}$

 Sales growth: Sale growth obtained through sales of the current year minus the sales of last year, divided by the sales of last year (Deloof, 2003). Companies with high growth rates are trying to pay more attention by lengthening the payment period and speed to collect from customers that eventually will lead to efficient working capital management, to their working capital management (same resource)

Data Analysis Method

Multivariate regression analysis is used for data analysis and testing hypothesis, this means that firstly the required data for doing the calculation and then the correlation between variables be evaluated using correlation coefficient. The statistical method used in this research is of cross-sectional data method. For testing hypothesis, first using F test, the accuracy of data integration is tested, then according to results of Hausman Test, the type of test method (fixed effects or random effects) is determined and according to the type of method, the estimation of the model is done. For measuring the significance of the whole model the F-statistic used and to evaluate the significance of coefficients of independent variables in each model statistics is used and at the %95 confidence level, took decisions for reject or accept the hypothesis.

Findings

Descriptive statistics of research variables in are presented in Table 1.

Table 1: Results of descriptive statistics

	NLB	CCC	SIZE	ROA	SG	SROI	SROA
Mean	0.123	302.088	13.655	0.176	0.227	415.992	592.227
middle	0.061	265.331	13.518	0.151	0.127	142.365	100.758
Max	1.321	411.290	18.936	0.656	15.877	13,286.280	103,000.100
Min	0.001	58.215	8.900	-0.248	-0.938	0.00087	0.00012
SD	0.182	609.929	1.430	0.141	1.017	1,037.042	4,776.394
Coefficient of variation	1.476	1.639	0.105	0.804	4.483	2.493	8.065
Skewness	3.494	11.321	0.626	0.568	10.734	7.062	18.408
Elongation	17.824	182.515	4.450	3.567	151.324	67.177	369.196
observations	624	624	624	624	624	624	624

Assess the Correlation between the Variables

Table 2: Results of correlation coefficient

Probability	NLB	CCC	SIZE	ROA	SG	SROI	SROA
NLB	1						

CCC	0.201	1					
	(0.000)	-----					
SIZE	0.571	0.508	1				
	(0.000)	(0.000)	-----				
ROA	0.410	0.391	0.581	1			
	(0.000)	(0.000)	(0.012)	-----			
SG	0.139	0.104	0.217	0.190	1		
	(0.001)	(0.009)	(0.000)	(0.000)	-----		
SROI	0.238	0.173	0.370	0.316	0.090	1	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.025)	-----	
SROA	0.087	0.061	0.124	0.123	0.044	0.034	1
	(0.030)	(0.028)	(0.002)	(0.002)	(0.269)	(0.390)	-----

According to table 2, we can say that the significance level of regression coefficients at a significant level of %5 between variables of research, there is no serious self-correlation problem.

The Test of F Limer

Table 3: results of F Limer and Husman tests

hypothesis	F Limer test			Hausman Test		
	The value of statistics	Probability statistics	method	The value of statistics	probability statistics	results
First hypothesis	27.582	0.000	Panel	17.458	0.008	Fixed effects model
Second hypothesis	2.927	0.000	Panel	36.365	0.000	Fixed effects model
Third hypothesis	3.653	0.000	Panel	42.365	0.001	Fixed effects model
Fourth hypothesis	3.5302	0.000	Panel	16.365	0.001	Fixed effects model

The value probability of the statistic of F Limer, for all hypothesis of research in table 3 is lower than %5 significance level and therefore, for the testing hypothesis of research, using the consolidated data is avoided.

After rejecting integration method (Pattern of common fixed amount), the researcher must use panel data and determine the type of panel data (Choose a fixed effect model or random effects model) the Hausman test is used. The test results are shown in Table 3.

According to obtained results, since the amount of P.value of Hausman test for all hypothesis of research is less than %5 significance level, therefore, we use a fixed effects model.

Testing of research hypotheses

Testing the first hypothesis

The first secondary hypothesis: there is a significant relationship between risk management of investment returns and the cash conversion period.

The model of second hypothesis test:

$$CCC_{it} = \beta_0 + \beta_1 SROI_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 SG_{it} + \varepsilon_{it}$$

Table 4: The results of the second research hypothesis

Dependent Variable: CCC

Variables	Coefficients	Standard error	Statistic value	Probability
C	683.507	52.646	12.983	0.000
SROI	-0.017	0.023	-2.920	0.010
SIZE	-19.553	3.520	-5.555	0.000
ROA	-45.917	15.264	-3.008	0.003
SG	-6.701	5.572	-1.203	0.230
AR(1)	0.358	0.118	3.036	0.003
R	0.857			
R^2	0.820			
F statistics	22.967			
F statistic probability	0.000			
Durbin-Watson statistic	2.133			

The results of the regression model are presented in Table 5 with GLS least generalized squares method. According to obtained results, we can say that, all of the characteristics of a company (Company size, profitability, as firm characteristics) affecting working capital management.

The results in Table 5 shows that the relationship of Cash Conversion Cycle with Risk Management of Return on assets is negative (-0.001) and is significant considering the probability of t-statistic (0.001).Also, results associated with F-statistics show that the model is significant in general and according to Durbin-Watson statistic lacks the problem of autocorrelation. In addition, results related to adjust the determination coefficient shows that in total research period almost %82 of changes of the cash conversion cycle has been under the influence of risk management of return on assets and also controlled variables. According to significantly the relationship between the cash conversion cycle Return on assets with risk management, the second secondary hypothesis of the main research hypothesis is confirmed.

The Third Hypothesis Testing

The third secondary hypothesis: there is a significant relationship between risk management of investment returns and Net Liquid Balance.

The model of third hypothesis test:

$$NLB_{it} = \beta_0 + \beta_1 SROI_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 SG_{it} + \varepsilon_{it}$$

The obtained results of the regression model with GLS generalized least squares presented in the table (6). According to obtained results, we can say that all attributes a company (Company size, profitability, as firm characteristics) affecting the management of corporate capital.

The results in Table 6 shows that the relationship of Net Liquid Balance with Risk Management of Return on investment is negative (-0.013) and is significant considering the probability of t-statistic (0.000).also, results associated with F-statistics show that the model is significant in general and according to Durbin-Watson statistic lacks the problem of autocorrelation. In adition, results related to adjusted determination coefficient shows that in total research period almost

%65 of changes of the Net Liquidity Balance has been under the influence of risk management of return on investment and also controlled variables. According to significantly the relationship between the Net Liquid Balance with Return on investment with risk management, the third secondary hypothesis of the main research hypothesis is confirmed.

Table (6): the regression analysis of the third hypothesis

Dependent Variable: NLB				
Variables	Coefficients	Standard error	Statistic value	Probability
C	0.064	0.015	4.383	0.000
SROI	-0.013	0.000	-4.935	0.000
SIZE	0.005	0.001	5.058	0.000
ROA	-0.025	0.008	-3.251	0.001
SG	0.001	0.001	0.480	0.632
AR(1)	0.126	0.088	2.429	0.015
R	0.728			
R^2	0.656			
F-statistic	10.190			
F statistic probability	0.000			
Durbin-Watson statistic	2.309			

The fourth hypothesis testing of research
The fourth secondary hypothesis: there is a significant relationship between risk management of return on assets and Net Liquid Balance.
The fourth test research hypotheses:
$$NLB_{it} = \beta_0 + \beta_1 SROA_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 SG_{it} + \varepsilon_{it}$$

Table 7: results of regression analysis of fourth research hypothesis

Dependent Variable: NLB				
Variables	Coefficients	Standard error	The value of statistic	Probability
C	0.067	0.014	4.992	0.000
SROA	-0.070	0.000	-3.583	0.000
SIZE	0.005	0.001	4.848	0.000
ROA	-0.030	0.007	-4.174	0.000
SG	0.000	0.001	-0.060	0.952
AR(1)	0.129	0.087	1.483	0.139
R	0.720			
R^2	0.707			
F-statistic	9.824			
F statistic probability	0.000			
Durbin-Watson statistic	2.209			

The obtained results of the regression model with GLS generalized least squares presented in the table (7). According to obtained results, we can say that all attributes a company (Company size, profitability, as firm characteristics) affecting the management of corporate capital.

The results in Table 7 shows that the relationship of Net Liquid Balance with Risk Management of Return on assets is negative (-0.070) and is significant considering the probability of t statistic (0.000). Also, results associated with F-statistics show that the model is significant in general and according to Durbin-Watson statistic lacks the problem of autocorrelation. In addition, results related to adjust the determination coefficient shows that in total research period almost %70 of changes of the Net Liquid Balance has been under the influence of risk management of return on assets and also controlled variables. According to significantly the relationship between the Net Liquid Balance with Return on assets with risk management, the fourth secondary hypothesis of the main research hypothesis is confirmed.

Discussions and Conclusion

The purpose of this research was to evaluate the relationship between risk management and working capital management in companies accepted in Tehran Stock Exchange during the time period of 2010-2015.Results indicated that there is a negative and significant relationship between risk management of investment return and the cash conversion cycle. It can be stated that as the risk management be effective through investment, the length of the cash conversion cycle in companies would be lower. In other words, whatever the managers are more willing to invest in current assets and increased the duration of the cash conversion cycle, risk management will be more inefficient. The results obtained from this hypothesis are consistent with previous research results of Raee et al (2004), Jamee (2001), Sharp et al, (1995), Deloof (2003), Moradi and Najjar (2013).

Results suggested that there is a negative and significant relationship between return on assets and the cash conversion cycle. It can be stated that the existence of risk management through company's return on assets, leads to decrease the length of the cash conversion cycle. In other words, corporate managers to reduce the risk of return assets using fewer investment policies in current assets and they are involving more in, constant assets that have less for the company. Results of this hypothesis are consistent partly with results of Zohdi et al (2010), Epohami (2008), Raee et al (2004), Jamee (2001), Sharp et al, (1995), Deloof (2003), Moradi and Najjar (2013).

Results indicated that there is the negative and significant relationship between risk management of investment returns and Net Liquid Balance.it can be stated that existence risk management through company's investment will lead to a decrease of holding liquidity and cash equivalents. In other words, corporate managers less using investing policies in current assets for decrease risk of return on invest and they are involving more in, constant assets that have less for the company. The results of this hypothesis are consistent partly with results of Nikomaram et al (2006), Horn (1969) Zohdi et al Moradi and Najjar (2013).

Results indicated that there is the negative and significant relationship between risk management of returns on assets and Net Liquid Balance.It can be stated

that existence risk management through returns on assets will lead to a decrease of holding liquidity and cash equivalents.In other words, corporate managers less using investing policies in current assets for decrease risk of return on assets and they are involving more in, constant assets that have less for the company. The results of this hypothesis are consistent partly with results of Nikomaram et al (2006), Zohdi et al Moradi and Najjar (2013).

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