

Investigating the Relationship between Working Capital Policy and Operational Risks in Listed Companies in Tehran Stock Exchange

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ABSTRACT: The decision is one the basic activities of management and is the most important content of decisions on working capital. Managers according to external and internal factors, risk and return should be choose the appropriate strategy for handling and managing working the capital. In this paper, the relationship between the politics of working capital and operational risks in listed companies in Tehran stock exchange will be investigated. To measure conservative and aggressive strategy variable for working capital, the ratio of current assets to total assets and ratio of current liabilities to total assets have been used. As well, the standard deviation of return on assets, the standard deviation of return on equity, the standard deviation of Tobin q ratio and the standard deviation of sales were used as an indicator for measuring operational risk. Using panel data, the survey findings of 71 companies listed in Tehran stock exchange, for the period 2005 to 2011 indicate there is a negative and negative relationship between conservative strategy of working capital and operational risks while there is a significant and positive relationship between aggressive strategy of working capital and operational risks.

Key words: Working Capital Management, Strategy, Conservative Strategy, Aggressive Strategy, Operational Risk.

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INTRODUCTION

Currently, one of the most important issues in financial management is working capital management that is discussed on the types of current assets and liabilities. For efficient working capital management in a company, anticipate and meet the cash required by the company is as a fundamental objective. In general, management of working capital means that cash, accounts receivable and goods inventory are maintained at a level to can be adequate to pay short-term bills and ongoing obligation. Given the importance of ongoing assets and liabilities are checked working capital strategies.

There are many studies about the components of working capital: Shane and Souenen (2002) and Dilof (2005) showed profitability and risk have an inverse relationship to return because the cash conversion cycle indicates that an aggressive policy of working capital significantly helps to improve company performance. A research which thoroughly is associated with topic of found working capital strategies and is found is Schoen Bacher's theoretical studies that was conducted in the context of financing strategies. He considered two finance strategies in his studies. In the conservative strategy business units postpone major operation while are provided the sufficient cash project to complete project, against in the aggressive strategy, despite limited resources, even before external financing do some of the major operations of projects, therefore, type of the strategy is effective on select project.

The company's net investments in working capital are represented. Operating assets and liabilities ultimately must be managed collaboratively, not individually. This paper tries to reflect this

requirement. Operational working capital is associated with cash flow and return on equity. Positive working capital requisite (or conservative working capital policy) is an additional investment that the company must generally create through the business process or the lines of credit to meet internal resources or reducing cash flow. Therefore, a conservative working capital policy implies opportunity costs or the cost of financing. A negative working capital indicates that companies through long-term assets are financed their working net capital, and this implies selection of an aggressive policy.

Generally, working capital management is simple and accurate means of ensuring an organization's ability to find the difference between short term assets and liabilities. (Harris 2005). In practice, working capital management has become one of the most important issues in organizations that many financial managers are competing to identify the main components of working capital and an appropriate level of working capital (Lamberson, 1995).

Companies can minimize the risk by understanding the roles and components of working capital, and improve overall company performance. A company can select an aggressive policy of working capital management policy with a lower level of current assets as a percentage of total assets or make it possible through high level of current liabilities as a percentage of total of liabilities for financial decisions. Excessive levels of current assets may have a negative impact on corporate profitability, while a low level of current assets may lead to a lower level of cash (Van Harn, 2004). Large financial firms focus on the study of long-term decisions especially capital structure,

dividend and evaluating decisions of company. However, further assets and liabilities are the main components of working capital and require a careful and more analysis. Current assets and liabilities management plays an important role for a company's profitability, risk and value. Optimum level of working capital is determined largely adopted ways to manage assets and current liabilities and this requires constant monitoring to maintain proper levels of various components of working capital as accounts receivable, goods inventories and payable accountability. (A'zam and Heidar, 2011)

According to the material presented and also the significance of variables for users of financial statements in this paper examines the relationship between working capital policies and operational risk. First, we refer to the theoretical basis and existing literature and regarding the research question, the hypotheses will be formulated. In the third section, methods for collecting data and testing hypotheses will be presented and in the fourth and fifth, findings and the results of this review is provided, respectively.

Theoretical Framework

Working capital management is an important part of management of the organization, primarily this part of management emphasizes on cash, securities, accounts receivable and goods inventory. Establishment of a balance in these accounts is critical. In other words, working capital management is a decision through it policy and practical techniques suitable for the control of current assets compared to current liabilities have been chosen and will be led to deliver maximum revenue of each share of company (Hampton and Warren 2005).

The purpose of the strategy is not compiled strategies in this research, but also is a mentality that is formed in managers consciously or unconsciously. There are various strategies about the working capital that is achieved from integrating the strategies of current assets and current liabilities. Working capital management of business unit should be choose appropriate strategies for companies according to various conditions to able manage current assets and current liabilities of a business unit and remove financing needs of the business unit, properly, and in this way reduce company operational risk, increase stock returns and maximize shareholder wealth.

The overall strategy of working capital about current assets and current liabilities are generally classified into three categories: Conservative strategy, aggressive strategy and moderate strategy. In the conservative strategy of the management of working capital, net working capital will be high and liquidity power is high excess. In these cases, the management

tries to bring (instantaneous) liquidity ratio and current ratio of the company to a scale that be more than values of industry average and simultaneously is lower than the current debt. On the other hand, aggressive strategy tries with having the least amount of current assets, wins the most (Filbek and Kreacher, 2005).

Moderate strategy is a moderate amounts of current assets and current liabilities and accepts a reasonable risk.

Working capital management and policies adopted in this field is a great important because these strategies manage firm's financial transactions with suppliers and purchasers in supply chain. Many factors such as cash management, risk management tools, debt ratio, and operating cash flow influence working capital of the organization that if are identified by well organization properly and are used can be helpful to improve performance in working capital. In turn, management of working capital and working capital policies adopted in the organization can also affect the financial performance and increase profitability for the organization and it provides an improved liquidity position (Hassanpour, 2007).

Changes that have recently taken place in the financial markets due to the development of new activities and new products create new types of risks as operational risks that are more complex and bigger. Bal committee has been introduce operational risk as a class apart market risk or credit risk. The committee has been defined the operational risk as the risk of direct or indirect loss and resulting failure of internal processes, people and systems or external processes (Willem 2005). In fact, the Bal committee aim was to minimize the standards for all financial agencies due to the lack of a single definition of risk. The separation is in order to cover all possible operational risks and to focus on the most important factors. Therefore, operational risk is defined as one of the risks of financial institution that can be reduced through control or can be eliminated through increase controls (Marco, 2004).

Financial manager who in further his time manage assets and current liabilities will be governed always thought of working capital which needs to the more precise method. Policies and procedures which creates financial management policy are based on the assumption that the company has made and implemented some major decisions. The decisions have two important functions on working capital management, primarily, the goods or services that are provided with sales forecasts or production and capable managers of working capital to estimate levels of current assets and current liabilities, second, managers of the company try through common stock

price increases to increase shareholders wealth of the company and it is performed by reducing operational risk, primarily through increase liquidity power and keep it. As a result, working capital policies generally are not determined with aims to increase earnings per share, but the purpose of managers is to achieve the desired liquidity and based on it reduce the risk of shareholders and provide profitability objectives of the company. The companies can be minimize the finance on the working capital, that is, get an aggressive policy or a conservative policy, therefore, management of the company is forced decide about balance between the risk and return on capital before choosing its working capital policy (Rajesh And Reddy,2011).

According to Solano and Teruel (2006) studies, working capital management policies of any company depends on the company managers. Managers with adopting different policies can effect on amounts of working capital, liquidity and profitability, and ultimately can determine the company's value. The Afza and Nazir (2007) researches about the relationship between aggressive and conservatism politics of working capital indicate a significant differences between working capital investment and financing policies in various industries (Afza and Nazir, 2007). Evidence from studies by Joyce et al. (2004) related to profitability as a benchmark for performance and policies of working capital support the fact that fiscal policy of aggressive working capital increases the profitability. It seem necessary for the smaller companies due to more use of the debts in comparing to the large scale companies aggressive working capital policy can reduce their operational risk but increase significantly their profitability. In general it can be argued that aggressive working capital policy, although it also has a lot of operational risk compared with conservative working capital policy has a higher profitability (Baltaji, 2005). Garcia and Martinez (2007) had examined the effect of working capital management on profitability of the small and medium enterprises and conclude that managers can with reducing turnover of accounts receivable and goods inventory create value on the company and with shorten up the cash conversion cycle and improve corporate profitability (Garcia and Martinez, 2007). Gill et al. (2010) chose 88 sample of companies listed on the New York Stock Exchange and with examination of the level of working capital on profitability concluded that there are a significant relationship between cash conversion cycle and corporates profitability. Almovala (2012) examined the effect of working capital management policies on corporate profitability and value. They concluded that a conservative investment policy has a positive effect on the profitability and

value of the company. Aggressive fiscal policies have a negative effect on the profitability and value of the company. Khorm Nejad (2007) did analysis of working capital management of pharmaceutical industry companies in the listed Exchange stock in Tehran based on a breakdown of financial and operational policies of the companies. According to the results of the study can be seen to some extent separate policies. Pharmaceutical companies total financial in general is aggressive and operational policies were conservative. The results of this study, net cash balance which reflects their operational policies, is at its greatest extent. Izadinia and Taki (2010) in a study investigated "Effects of working capital management on the profitability of listed companies in Tehran Stock Exchange". Regression results show a negative relationship between cash conversion cycle and return on assets and also high investment in goods inventory and accounts receivable will lead to low profitability.

Eslahi Jourshari (2012), examined the impact of working capital management on profitability of listed companies in Tehran Stock Exchange. Results of the research suggested that the working capital management has a highly significant impact on corporate profitability. Also results of the research showed that the current ratio, sales growth, operational income and debt ratio have significant influence on corporate profitability.

According to these stated hypothesis of this research can be stated as follows:

The main hypothesis 1: there is a significant relationship between strategy of working capital and the standard deviation of return on assets.

The sub hypothesis 1-1: there is a significant relationship between conservative strategy of working capital and the standard deviation of return on assets.

The sub hypothesis 1-2: there is a significant relationship between aggressive strategy of working capital and the standard deviation of return on assets.

The main hypothesis 2: there is a significant relationship between strategy of working capital and the standard deviation of return on equity.

The sub hypothesis 2-1: there is a significant relationship between conservative strategy of working capital and the standard deviation of return on equity.

The sub hypothesis 2-2: there is a significant relationship between aggressive strategy of working capital and the standard deviation of return on equity.

The main hypothesis 3: there is a significant relationship between the strategies of working capital and a standard deviation of Tobin q.

The sub hypothesis 3-1: there is a significant relationship between conservative strategy of working capital and a standard deviation of Tobin q.

The sub hypothesis 3-2: there is a significant relationship between aggressive strategy of working capital and a standard deviation of Tobin q.

The main hypothesis 4: there is a significant relationship between strategies of working capital and the standard deviation of sales.

The sub hypothesis 4-1: there is a significant relationship between conservative strategy of working capital and the standard deviation of sales.

The sub hypothesis 4-2: there is a significant relationship between aggressive strategy of working capital and the standard deviation of sales.

MATERIAL AND METHODS

This study is applied research in terms of the purpose type and data gathering was performed by use of the library studies and to test the hypotheses a multivariate regression models was used. In addition, the study, based on the characteristics of the subject and the research question has placed in the field of descriptive and correlational research (Earth, 2007). In order to obtain data required for processing hypothesis, the information contained in Rahavard Novin software has been used. Then to collect and classify data has been used Excel software and for the statistical analysis, EViews version 6 software, is applied.

Methods of data analysis

In the present study, according to the type of data and methods of analysis, panel data techniques are used. In this study to test the significance of the regression equation the Fisher statistic (F) at the level of 95% confidence and for testing the significance of each of the coefficients, t-test was used. Also, the self-correlation between the model errors was evaluated by Durbin - Watson test, based on the test if the Durbin - Watson statistics be between 1.5 to 2.5, can be accept the hypothesis of there is no correlation between the model errors.

Variables and statistical models

The independent variables for this study include conservative strategy and the strategy working capital. Dependent variable of the research is operational risk and for measuring it the standard deviation of return on assets, standard deviation of return on equity, standard deviation of Tobin q and standard deviations selling are used. Moreover, in this study, the effect of firm size variables, current ratio, debt ratio, and sales growth has been controlled.

Model 1

$$SD \text{ ROA}_{it} = \alpha + \beta_1 \left(\frac{TCA}{TA_{it}} \right) + \beta_2 \left(\frac{TCL}{TA_{it}} \right) + \beta_3 CR_{it} + \beta_4 DEBT_{it} + \beta_5 SIZE_{it} + \beta_6 SGROW_{it} + \varepsilon_{it} SD$$

α : constant

$SDROA_{it}$: is Standard deviation of return on assets and return on assets is calculated from the ratio of profit before tax than average assets. To calculate the standard deviation of asset returns, we first calculate the variance of asset returns and take the square root of variance accounted for to measure the standard deviation is calculated as follows:

$$\sigma^2 = \frac{\sum(x_i - \bar{x})^2}{n}$$

$$SD = \sigma = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n}}$$

$\left(\frac{TCA}{TA_{it}} \right)$: Where this ratio is lower (lower than average assets) means an aggressive policy and where this ratio is higher (higher than average assets) means a conservative policy.

TCA: total current assets

TA: total assets

$\left(\frac{TCL}{TA_{it}} \right)$: Where this ratio is higher (higher than average assets) means an aggressive policy and where this ratio is lower (lower than average assets) means a conservative policy.

TCL: total current liabilities

CR_{it} : Current ratio which is calculated in form of the ratio of current assets to current liabilities.

$DEBT_{it}$: The debt ratio which is calculated in form of the current assets to current liabilities.

$SIZE_{it}$: The natural logarithm of sales

$SGROW_{it}$: is Sales growth, that is, the change in sales of a year from the previous year.

ε_{it} : the Model Error.

Model 2

$$SDROE_{it} = \alpha + \beta_1 \left(\frac{TCA}{TA_{it}} \right) + \beta_2 \left(\frac{TCL}{TA_{it}} \right) + \beta_3 CR_{it} + \beta_4 DEBT_{it} + \beta_5 SIZE_{it} + \beta_6 SGROW_{it} + \varepsilon_{it}$$

: $SDROA_{it}$: is Standard deviation of return on equity that return on equity is calculated by the ratio of net profit after tax to the average book value of equity. Then act as explained above about standard deviation of return on assets.

Model 3

$$SDTobin'sq = \alpha + \beta_1 \left(\frac{TCA}{TA_{it}} \right) + \beta_2 \left(\frac{TCL}{TA_{it}} \right) + \beta_3 CR_{it} + \beta_4 DEBT_{it} + \beta_5 SIZE_{it} + \beta_6 SGROW_{it} + \varepsilon_{it} SDTobin'sq: Tobin q's Standard deviation ratio which is calculated as follows:$$

$$Q = \frac{MV(CS) + MV(PS) + BV(LTD) + BV(SLD)}{BV(TA)}$$

MV (CS): Year-end market value of Company common stock

MV (PS): Estimation of year-end market value of preferred company stock

BV (LTD): Year-end book value of company long-term debt

BV (SLD): the Company's year-end book value of company debt with maturities of less than one year

BV (TA): Year-end book value of company total assets

Then as explained about calculation of the standard deviation return on assets and standard deviation of return on equity, standard deviation than Tobin q is calculated through a formula related to the variance and standard deviation.

$$SD\ Sales = \alpha + \beta_1 \left(\frac{TCA}{TA_{it}} \right) + \beta_2 \left(\frac{TCL}{TA_{it}} \right) + \beta_3 CR_{it} + \beta_4 DEBT_{it} + \beta_5 SIZE_{it} + \beta_6 SGROW_{it} + \varepsilon_{it}$$

SD Sales: Standard deviation that calculate the sales variance through data obtained of corporate sales, and then take the square root of the variance and therefore the standard deviation of these variables are measured.

Population and sample

The population of this study is all listed companies in Tehran Stock Exchange during the period 2005 to 2011. Companies surveyed are selected by the systematic elimination or targeted based on the following criteria:

Their fiscal year is ending March 29 of each year. Surveyed companies have been joined stock before 2005. Sample companies have operational losses during the period under review. These companies should have information such as items of current assets, total assets and total liabilities during the period 2005 to 2011. It was not among investment firms and financial intermediation.

According to studies conducted, 71 companies which are eligible above conditions have been investigated in the period 2005 to 2011 (479 year-company).

Tests of Panel Data

It should be performed different methods for identifying an appropriate estimation method when panel data are used. The most common method are Chow test, Brosh-Pagan test and Hausman tests.

Chow Test

Chow (1960) introduced a test that is used for the choice between OLS of integrated data model, and fixed effects model. The Chow statistics probability value for the first, second and third model in the Chow test table is more than significance level of 5% and therefore, to test the hypotheses using data proved method is dropped and should be used the combination of data method (in the combination data, we measure the variables both among in the population (the company) and over time (years).

Brosh - Pagan Test

Brosh-Pagan (1980) used Lagrange coefficient method (LM) to test the model of data integrated

versus the two ways random effects and using the method of maximum likelihood estimation is obtained. In this test, the null hypothesis means the better use of data integrated models and reject the null hypothesis means the existence of random effects in the model. According to the Brosh- Pagan test statistics value in the table associated with this test, the null hypothesis is confirmed and the integrated data model should be used.

Table 1. Chow test results

Type of test	The test statistic value	Degrees of freedom	Likelihood of the test statistic
The first model	1.68	(5,485)	0.137
The second model	0.56	(5,485)	0.1207
The third model	0.945	(5,485)	0.455
The fourth model	21.736	(5,485)	0.000

Table 2. Pagan Brouch test results

Type of test	The test statistic value	Degrees of freedom	Likelihood of the test statistic
The first model	0.93	(5,491)	0.454
The second model	1.593	(6,489)	0.147
The third model	12.955	(6,489)	0.123
The fourth model	2.616	(6,489)	0.016

Hausman Test

Hausman test utilize to determine the method used among the fixed effects and random effects methods. In this test, if H0 is rejected, meaning existence of a fixed effects model and if H0 is accepted, it is better to use the random effects model for estimation. Since the models 1, 2 and 3 of Chow and Brosh- Pagan statistics was not at the significant level and data integrated method will used and there is no longer needed to evaluate the Hausman test to select between the fixed effects model and random effects model. According to the results of table, it becomes clear that the null hypothesis is confirmed for the fourth model and it is better to use the random effects model for estimation.

Table 3. Results of the Hausman test

Type of test	The test statistic value	Degrees of freedom	Likelihood of the test statistic
The fourth model	7.959	(6,489)	0.241

RESULTS

Descriptive Statistics

Descriptive statistics related to all variables used in this research at table 1 is shown.

According to Table 4 of descriptive statistics, it can be seen that desired components are: the average size (5.54), current ratio (1.21), debt ratio (0.86), sales growth (0.17), standard deviation of Tobin q (128134.8), standard deviation of assets return on (0.60), standard deviation of return on equity (0.25), standard deviation of sales (128280.8), conservative strategy (0.58) and aggressive strategy (0.64). Also according to coefficient of variation that is obtained through the ratio of the standard deviation to the mean, it is observed that the maximum dispersion of sales growth is (3.10), which represents a large deviation of company sales growth from the mean of

the sales growth and the lowest dispersion is related to firm size (0.11), which shows a slight deviation from the average firm size.

Statistics Inferential

At this stage of analysis, each of the research hypotheses to be tested. For choosing the correct test to analyze the hypotheses, first, the statistical distribution of the variables that are examined must be ensured. Prerequisite for parametric testing is normality of statistical distribution of variables. Kolmogorov - Smirnov test has been used to test the normality test variables that the results of this test are shown in Table 2.

According to normality of distribution of dependent and independent variables, regression model can be used.

Table 4. Descriptive statistics of variables

Variables	Current Ratio	Debt ratio	Sales growth	Standard deviation Kiotobin	standard deviation of return on assets	Standard deviation of return on equity	Standard deviation of Sales	Company size	conservative strategy	Aggressive strategy
Average	1.21	0.86	0.17	128134.8	0.06	0.25	128280.8	4.45	0.58	0.64
Median	1	0.91	0.09	59622.77	0.04	0.12	59622.77	5.58	0.60	0.59
Maximum	6.91	1.42	8.23	2233218	0.75	3.51	2233218	6.88	0.96	3.60
Minimum	0.190	0.0	0.87-	0.00	0.00	0.00	0.00	2.83	0.07	0.00
Standard deviation	0.65	0.15	0.51	22399.80	0.07	0.44	0.2231940	0.58	0.21	0.48
Coefficient of Variation	0.58	0.18	3.10	1.74	1.16	1.78	1.73	0.11	0.37	0.76
Number of observations	479	479	479	479	479	479	479	479	479	479

Table 5: Test of be normal of distribution of variables

Variables	Aggressive strategy	Conservative strategy	Company size	standard deviation of Sales	Standard deviation of return on equity	The standard deviation of return on assets	Standard deviation of Kiotobin	Sales growth	Debt ratio	Current Ratio
Statistics of k-s	9133.21	19.341	776.19	19100	12203	43925.23	19057.18	359,709	743.24	4675.27
Significance level	0.070	0.120	0.060	0.330	0.082	0.075	0.060	0.130	12:08	0.000

Investigate the research hypothesis

The sub hypothesis 1-1: there is a significant relationship between conservative strategy of working capital and the standard deviation of return on assets. The results of the first hypothesis statistical tests are listed in table 6. As this table shows the conservative strategy variable (p -value < 0.05) has a negative and significant relationship with standard deviation of return on assets. Also, there is a significant and negative relationship between firm size and the standard deviation of return on assets. With attention to value of statistics F, (p -value < 0.05) the fitted

regression model is significant. The coefficient of determination obtained indicates that 7% of the standard deviation change of return on assets is expressed by independent variable of conservative strategy and the control variables of the debt ratio, current ratio, company size and sales growth. The Watson- Durbin value (2.09) shows there is no an autocorrelation phenomena between the residual errors of models.

The sub hypothesis 1-2: there is a significant relationship between aggressive strategy of working capital and the standard deviation of return on assets.

The results of the hypothesis 1-2 statistical tests are listed in Table 7. As this table shows the conservative strategy variable ($p\text{-value} < 0.05$) has a negative and significant relationship with standard deviation of return on assets. Also, there is a significant and negative relationship between firm size and the standard deviation of return on assets. With attention to value of statistics F, ($p\text{-value} < 0.05$) the fitted regression model is significant. The coefficient of determination obtained indicates that 19% of the standard deviation change of return on assets is expressed by independent variable of conservative strategy and control variables of the debt ratio, current ratio, company size and sales growth. The Watson- Durbin value (2.10) shows there is no an autocorrelation phenomena between the residual errors of models.

The sub hypothesis 2-1: there is a significant relationship between aggressive strategy of working capital and the standard deviation of return on equity. The results of the hypothesis 2-1 statistical tests are listed in table 8. As this table shows the conservative strategy variable ($p\text{-value} < 0.05$) has a negative and significant relationship with standard deviation of return on equity. Also, there is a significant and negative relationship between firm size and the standard deviation of return on equity. With attention to value of statistics F, ($p\text{-value} < 0.05$) the fitted regression model is significant. The coefficient of determination obtained indicates that 3% of the standard deviation change of return on equity is expressed by independent variable of conservative strategy and the control variables of the debt ratio, current ratio, company size and sales growth. The Watson- Durbin value (1.89) shows there is no an autocorrelation phenomena between the residual errors of models.

The sub hypothesis 2-2: there is a significant relationship between aggressive strategy of working capital and the standard deviation of return on equity. The results of the hypothesis 2-2 statistical tests are listed in table 9. As this table shows the aggressive strategy variable ($p\text{-value} > 0.05$) has a negative and significant relationship with standard deviation of return on equity. Also, there is a significant and negative relationship between firm size and the standard deviation of return on equity. With attention to value of statistics F, ($p\text{-value} < 0.05$) the fitted regression model is significant. The coefficient of determination obtained indicates that 2.8% of the standard deviation change of return on equity is expressed by independent variable of aggressive strategy and the control variables of the debt ratio, current ratio, company size and sales growth. The Watson- Durbin value (1.89) shows there is no an

autocorrelation phenomena between the residual errors of models.

The sub hypothesis 3-1: There is a significant relationship between conservative strategy of working capital and a standard deviation of Tobin q. The results of the hypothesis 3-1 statistical tests are listed in table 10. As this table shows the conservative strategy variable ($p\text{-value} > 0.05$) has a negative and significant relationship with standard deviation of Tobin q ratio. Also, there is a significant and negative relationship between firm size and the standard deviation of Tobin q ratio. With attention to value of statistics F, ($p\text{-value} < 0.05$) the fitted regression model is significant. The coefficient of determination obtained indicates that 29% of the standard deviation change of Tobin q ratio is expressed by independent variable of conservative strategy and the control variables of the debt ratio, current ratio, company size and sales growth. The Watson- Durbin value (1.82) shows there is no an autocorrelation phenomena between the residual errors of models.

The sub hypothesis 3-2: There is a significant relationship between aggressive strategy of working capital and a standard deviation of Tobin q. The results of the hypothesis 3-2 statistical tests are listed in table 11. As this table shows the aggressive strategy variable ($p\text{-value} < 0.05$) has a negative and significant relationship with standard deviation of Tobin q ratio. Also, there is a significant and negative relationship between firm size and the standard deviation of Tobin q ratio. With attention to value of statistics F, ($p\text{-value} < 0.05$) the fitted regression model is significant. The coefficient of determination obtained indicates that 29% of the standard deviation change of Tobin q ratio is expressed by independent variable of aggressive strategy and the control variables of the debt ratio, current ratio, company size and sales growth. The Watson- Durbin value (1.82) shows there is no an autocorrelation phenomena between the residual errors of models.

The sub hypothesis 4-1: There is a significant relationship between conservative strategy of working capital and the standard deviation of sales. The results of the hypothesis 4-1 statistical tests are listed in table 11. As this table shows the aggressive strategy variable ($p\text{-value} < 0.05$) has a negative and significant relationship with standard deviation of Tobin q ratio. Also, there is a significant and negative relationship between firm size and the standard deviation of Tobin q ratio. With attention to value of statistics F, ($p\text{-value} < 0.05$) the fitted regression model is significant. The coefficient of determination obtained indicates that 36% of the standard deviation change of Tobin q ratio is expressed by independent variable of aggressive strategy and the control variables of the debt ratio, current ratio, company size and sales growth. The

Watson- Durbin value (1.82) shows there is no an autocorrelation phenomena between the residual errors of models.

The sub hypothesis 4-2: There is a significant relationship between conservative strategy of working capital and the standard deviation of sales. The results of the hypothesis 4-2 statistical tests are listed in table 13. As this table shows the conservative strategy variable (p-value < 0.05) has a negative and significant relationship with standard deviation of Tobin q ratio. Also, there is a significant and negative relationship

between firm size and the standard deviation of Tobin q ratio. With attention to value of statistics F, (p-value < 0.05) the fitted regression model is significant. The coefficient of determination obtained indicates that 34% of the standard deviation change of Tobin q ratio is expressed by independent variable of conservative strategy and the control variables of the debt ratio, current ratio, company size and sales growth. The Watson- Durbin value (1.82) shows there is no an autocorrelation phenomena between the residual errors of models.

Table 6. Results of Regression Test for Sub Hypothesis 1-1

Result Of Hypothesis	Durbin - Watson	The Coefficient of Determination	P-Value F	P-Value T	T-Statistics	Beta Coefficient	Variable Name
Confirm the hypothesis	2.09	07	0.000	0.0424	0.7990	-0.0134	Conservative strategy
				0.000	-6.4979	-0.0313	Company size
				0.3880	0.8640	-0.0193	Debt ratio
				-0.7403	-0.3315	-0.0015	Current Ratio
				0.4491	0.7574	0.0041	Sales growth

Table 7. Results of Regression Test for Sub Hypothesis 1-2

Result Of Hypothesis	Durbin - Watson	The Coefficient of Determination	P-Value F	P-Value T	T-Statistics	Beta Coefficient	Variable Name
Confirm the hypothesis	2.10	0.19	0.000	0.0033	0.9492	0.0205	Aggressive strategy
				0.0000	-0.7475	-0.0323	Company size
				0.0089	-0.6263	0.05244	Debt
				0.4377	0.7766	0.0037	Current Ratio
				0.3919	0.8569	0.0046	Sales growth

Table 8. Results of Regression Test for The Sub Hypothesis 2-1

Result Of Hypothesis	Durbin - Watson	The Coefficient of Determination	P-Value F	P-Value T	T-Statistics	Beta Coefficient	Variable Name
Confirm the hypothesis	1.89	12.03	0.000	0.0056	-0.9139	0.2238	Conservative strategy
				0.0004	-3.5458	0.1185	Company size
				5170	6484	0.1008	Debt
				0.0042	-2.8788	0.09388	Current Ratio
				0.6265	0.48692	-0.0184	Sales growth

Table 9. Results of Regression Test for The Sub Hypothesis 2-2

Result Of Hypothesis	Durbin - Watson	The Coefficient of Determination	P-Value F	P-Value T	T-Statistics	Beta Coefficient	Variable Name
Reject the hypothesis	1.89	0.028	0.000	0.7706	0.2917	0.0142	Aggressive strategy
				0.0004	0.5523	0.1195	Company size
				0.7180	0.3613	0.0506	Debt
				0.0579	0.9008	-0.0651	Current Ratio
				0.7209	0.3574	-0.0136	Sales growth

Table 10. results of Regression Test for The Sub Hypothesis 3-1

Result Of Hypothesis	Durbin - Watson	The Coefficient of Determination	P-Value F	P-Value T	T-Statistics	Beta Coefficient	Variable Name
Reject the hypothesis	1.82	0.29	0.000	0.6121	0.5073	-25556.59	Conservative strategy
				0.0000	13.884	199940.3	Company size
				0.4127	0.8198	54912.38	Debt
				0.0011	2703/3	45933.77	Current Ratio
				0.9716	0.0355	581.8701	Sales growth

Figure 11. Results of Regression Test for The Sub Hypothesis 3-2

Result Of Hypothesis	Durbin - Watson	The Coefficient of Determination	P-Value F	P-Value T	T-Statistics	Beta Coefficient	Variable Name
Confirm the hypothesis	1.82	12.29	0.000	0.02996	1.038 328	-21786.95	Aggressive strategy
				0.0000	13.93690	201073.4	Company size
				0.3173	1.001 011	60159.05	Debt
				0.0147	2.449493	35988.02	Current Ratio
				0.9646	0.044402	-725.0832	Sales growth

Table 12. Results of Regression Test for Sub Hypothesis 4-1

Result Of Hypothesis	Durbin - Watson	The Coefficient of Determination	P-Value F	P-Value T	T-Statistics	Beta Coefficient	Variable Name
Confirm the hypothesis	1.82	12.36	0.000	0.02955	1. 047161	-21975.28	Conservative strategy
				0.0000	13.91284	200753.6	Company size
				0.3108	1.014 580	60982.85	Debt
				0.0149	2.443111	35899.14	Current Ratio
				0.9611	-0.048768	-796.4939	Sales growth

Table 13. Results of Regression Test for Sub Hypothesis 4-2

Result Of Hypothesis	Durbin - Watson	The Coefficient of Determination	P-Value F	P-Value T	T-Statistics	Beta Coefficient	Variable Name
Confirm the hypothesis	1.72	12.34	0.000	0.0349	0.417683	-26078.74	Aggressive strategy
				0.0000	85959/13	199610.4	Company size
				0.4043	834701	55916.20	Debt
				0.0011	271931/3	45963.21	Current Ratio
				0.9743	0.032256	527.6065	Sales growth

CONCLUSIONS

In this study, with regard to the control variables of firm size, debt ratio, current ratio and sales growth of the company, were reviewed the relationship between working capital policy and operational risks in listed companies in Tehran Stock Exchange in the period 2005 to 2011. Results of the hypothesis test show that a significant inverse relationship between conservative strategy and standard deviation of return on assets, while there is a positive and significant relationship between the aggressive strategy and standard deviation of return on assets. The results also indicate that there is a negative and significant relationship between conservative strategy and standard deviation of return on equity, while the evidence implies no significant relationship between conservative strategy and standard deviation of return on equity. Another result of the study is that there is a significant positive relationship between conservative strategy of working capital and a standard deviation of Tobin q ratio, while there is no significant relationship between conservative strategy of working capital and a standard deviation of Tobin q ratio. The main result of the study is that there is a negative and significant relationship between the conservative strategy of working capital and operational risks while there is a

positive and significant relationship between the conservative strategy of working capital and operational risks. Other findings indicate that firm size and current ratio have a significant relationship with operational risk.

Research suggestions

The following suggestions are offered for future research:

- This research is done separately for different industries.
- Other criteria should be used to measure the variables. For example, to determine the types of strategies can be used other financial ratios, such as the instantaneous ratio and current ratio.
- Assess the impact of working capital management of operational risk in the public and private sectors
- Examine the role of working capital management activities in continuation of profit unit's activities

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