The Effect of Working Capital Management on Reducing the Stock Price Crash Risk (Case Study: Companies Listed in Tehran Stock Exchange)

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ABSTRACT: Present study examines the effect of working capital management on reducing the risk of decrease in stock prices. Decrease in stock prices can be due to weak and inefficient strategies taken by managers. One of the most important strategies taken by management is working capital management. Working capital management deals with managing the current assets and current liabilities. In case of inadequate policies to manage the company's working capital, finance manager could decrease current assets and increase current liabilities. Adopting this approach can lead the company to insolvency and bankruptcy due to poor liquidity position. Delay in payment of company's debts can affect the credit rating of company and diversely affect company's reputation and consequently weaken competitive advantage which can finally lead to decrease in stock prices. Considering the importance of working capital management in performance of firms, this research aims to answer the question whether working capital management can affect the stock prices or not. To measure the working capital we made use of Gitman's cash conversion cycle (1974) and Chen's negative factor stock return skewness model (2001) to measure the stock prices falls in 59 listed companies in Tehran stock exchange between 1998 and 2011. This study provides strong evidence that working capital management is likely to significantly reduce the risk of falling stock prices.

Key word: working capital management, cash conversion cycle, Stock Price Crash Risk, Negative Coefficient of Skewness of Stock Return

INTRODUCTION

Nowadays, in almost all of the companies, working capital constitutes a considerable portion of the total capital; therefore its management is very important. Working capital is an essential factor in prosperity of companies and requires due attention and control. Working capital management seeks the situation in which there is no excess or shortage of cash. Failure to maintain an appropriate level of liquidity for a company can cause a company to lose its short-term investment opportunities and it may not have timely access to raw materials for productions of goods. The company may also fail to fulfill its obligations in a timely manner that could have an adverse effect on its credit. Such a company will not be able to use the opportunities in the market and lucrative projects because of lack of resources. This company will not be able to supply required equipment and use cash discounts. Continuation of this situation can cause fall in stock prices and finally decrease in company's value. Given the above issue, in the present research we try to study the effect of working capital management on reduction of risk of fall in stock prices in listed companies in Tehran stock exchange.

The Research Theoretical Review
Working capital and its management

The cash needed to run daily routines in a firm is called working capital. According to this, working capital management is the optimized composition of working capital's items (current assets and liabilities), so that it maximizes shareholders' wealth. Generally, working capital management is associated with daily routines and it has nothing to do with long-term decisions. For instance: access to raw materials, giving credits to the customers and collecting matured debts, making tabs for credit purchase, cash-account management and etc. These factors make everyday tasks easier for the firm.
One of the best criteria to assess the quality of working capital management is cash conversion cycle. Cash conversion cycle represents the time in which a firm consumes cash in operative process to produce a product. Cash conversion cycle includes three criteria:

**Inventory conversion period**

It's the length of time on average needed to convert raw materials into finished goods and selling these goods.

**Payable deferral period**

It's the average length of time needed to purchase goods and the payments for them.

**Receivable conversion period**

It's the average number of days from the sale of goods to collection of resulting receivables.

According to the existing theoretic bases, reduction in cash conversion cycle is a desired feature which firms should be after as prolonging it requires heavy external costs. Therefore reducing the period in which cash is involved in working capital, a firm can achieve a better performance. Cash conversion cycle could be reduced by reducing inventory conversion period through a quicker production or sale, or by reducing the time during which receivable accounts are collected through expediting the collection process, or by prolonging payable accounts' maturity date through rebating the payments process to sellers.

**The Research Review of Literature**

Nobanee [1] in his study titled as “working capital management and firm’s profitability” says that there is a traditional relationship between cash conversion cycle and a firm’s profitability. In fact, as cash conversion cycle decreases profitability increases and vice versa. Also finding an optimized level for the inventories, payable accounts and receivable accounts (in which maintenance and opportunity costs are minimized) and re-calculating cash conversion cycle considering these optimized levels, gives us a precise and perfect view of efficiency of working capital management. This researcher believes that cash conversion cycle is the best and the most exquisite criterion to assess working capital management. Kieschnick et al [2] analyzed the relationship between working capital management and shareholders wealth. The results of their study showed that a one Dollar investment can have a considerable effect on expected sale level, financial restrictions and debt pressures. Also more investments on increasing level of given credits to the customers than extra investments on stocks have more effects on shareholders wealth. Garcia et al [3] realized that decreasing cash conversion cycle can improve profitability as they were studying the effects of working capital management on profitability in small and medium size firms in Spain. Lazaridis et al [4] conducted a study on the relationship between working capital management and the profitability in companies listed in Athens stock exchange. Results of that study imparted that there is a meaningful converse relationship between profitability and cash conversion cycle. Managers can also increase profits through proper management of cash conversion cycle and maintaining its items (receivable accounts, payable accounts, and inventories) in an optimized level.

Chen et al [1] have been predicted stock price crash by three variables that include trading volume, past returns and stock price skewness. The results of this paper show that the negative skewness of daily stock returns is important in a stock that experienced the two following: First, an increase in trading volume of stock compared to the past six months and experienced the positive returns in more than 36 month ago. Hong et al [2] are discussed that the heterogeneity of investors opinions a reason to expedite the stock price crash risk phenomenon. On the other hand, they noted that the lack of information asymmetry between investors. Jin et al [3] were investigated relationship between lacks of informational transparency and stock price crash in the capital market of different countries. They found that the lack of transparency in the markets in which financial information is high, the stock price crash is more. Hutton et al [4] studied the relationship between transparency in financial statements and correlation between stock prices, financial information and stock prices crash phenomenon. The results suggest that the lack of transparency of accounting information caused to a little change in stock prices due to new financial disclosure. On the other hand, these researchers have expressed a lower correlation between financial information and stock prices may lead to increase stock price crash risk. Kim et al [5] had been studied about the relationship between conservative accounting and stock prices crash in America. The results indicate that tax evasion make opportunities for managers to hide bad news about the activities that mislead investors and this problem led to stock price crash phenomena. In their research, Callen and Fang [6] examined the relation between institutional investors and company's stock price crash. They have tested two opposite approaches i.e. supervisory view and expropriation view about institutional investors. The results have indicated that there is undoubtedly an inverse relation between institutional owners and stock price crash in future.
Tools for Data Collection and Analysis of Their
Since the research method of this paper is a field method and dealing with real data and to provide the information about companies with respect to research variables that are related to financial information, various sources have been used that including CDs of Tehran Stock Exchange, tadбир software and website of Tehran stock exchange. For data processing, Excel and SPSS software are used.

Population and Statistical Sample
The population of this study includes all companies listed in Tehran Stock Exchange. For sampling, the companies have been selected that 1. They are active in Stock Exchange from 1998 to 2011, 2. Fiscal year ended in March, 3. Financial changes have not accrued in the course of the study, 4. This company is not member of investment firms and financial intermediaries, 5. At least 6 months of the year have monthly returns, 6. Information of company is available. Finally with the above restrictions, 58 companies are selected for this research.

Hypothesis of Research
There’s a meaningful relationship between working capital management and stock price crash risk in firms.

The Research Variables

Dependent Variable
Considering the research hypothesis, the dependent variable of this study is stock price crash for measuring which negative coefficient of skewness model (Chen, 2001) has been used as follows:

\[ NCSKEW_{it} = \frac{-\left[ n (n-1)^{3/2} \sum W_{it} \right]}{\left[ (n-1)(n-2)( \sum W_{it} )^{3/2} \right]} \]

In this model \( W_{it} \) indicates the monthly special return of company \( i \) in the month \( t \). The letter \( n \) is the number of monthly returns observed during financial year. According to this model, the higher the negative coefficient of skewness, the more likely the company will be liable to stock price crash.

"Special monthly returns of company." We show that it \( W \) (Eq. (1)) is equal to the natural logarithm of number one plus the number of \( \varepsilon \) that is obtained by Eq. (2).

\[ W_{it} = \ln\left(1+\varepsilon_{it}\right) \]

\[ r_{j,t} = \alpha_{j} + \beta_{1}r_{m,t} + \beta_{2}r_{m,t-1} + \beta_{3}r_{m,t-2} + \beta_{4}\varepsilon_{j,t} \]

In Eq. (2), \( r_{j,t} \) is the stock return of \( J \) Company in the \( t \) month and \( r_{m,t} \) is the monthly market return (based on market indicators).

Independent variable
Considering the research hypothesis, the independent variable of this study is Working capital management for measuring which cash conversion cycle model (Lazaridis, 2006) has been used as follows:

\[ \text{Cash conversion cycle} = \text{Inventory conversion period} + \text{Receivable conversion period} - \text{Payable deferral period} \]

Each one of the factors in cash conversion cycle is calculated by the equations given:

\[ \text{Receivable conversion period} = \text{receivable accounts’ average/ sale} \times 365 \]

\[ \text{Inventory conversion period} = \text{Inventory’ average/ Cost of Goods Sold} \times 365 \]

\[ \text{Payable deferral period} = \text{payable accounts’ average/ Cost of Goods Sold} \times 365 \]

The controlled Variables of the Research
To determine the precise effect of conservatism on stock price crash risk, several control variables that may affect the stock price crash have been used.

Heterogeneity of Investors’ Beliefs
Chen et al found that the heterogeneity in investor beliefs in the current year has a strong relationship with negative skewness of stock returns in the next year. In this study, for measuring this variable, difference between the average monthly trading volume in the current year and the average monthly trading volume in the previous year were used.

Negative Coefficient of Skewness (NCSKEW)
Chen et al also concluded in their study that the companies have a negative coefficient of skewness in the current year, will have a less negative coefficient of skewness in the next year.

Standard Deviation of Monthly Returns
Chen et al also concluded in their study that the companies have a more fluctuate in the current year will have a more negative coefficient of skewness in the next year.
Monthly Average of Return
Chen et al also presented evidence which stated that the crash of future stock price in the long run will increase, for example a period of 12 to 36 months. Because of this and for controlling variables, we have entered a monthly average returns for the last 12 months in the original model.

Profitability Index
For controlling between company profitability and risk of stock price crash, we used the ratio of net profit to total shareholders' equity.

Financial Leverage
According to Hutton et al., increasing the amount of debt can increase the interest cost. Therefore, the increase of financial leverage can lead to reduced profits. Increasing the amount of debt in capital structure can lead to increase negative coefficient of skewness. In this study, for controlling the effect of variables, we have used the long time debt ratio to total of assets at the end of the period.

Size of Company
To control the size of our company, we have used the logarithm of total assets at the end of period.

Conservativeness
Zhang and Kim have examined the relation between conservative accounting and stock price crash. The results have shown that conservative accounting decreases the possibility of crash in stock price. For measuring this variable, Givoly's et al model has been used.

Introducing the Research Model
For testing the research hypothesis the model below has been used:

\[
\text{NCSKEW}_{t+1} = \alpha_0 + \alpha_1 CCC_{it} + \sum_{q=2}^{m} \alpha_q (q^{th} \text{Control Variables}) + \varepsilon_t
\]

This model \( \text{NCSKEW}_{t+1} \) signifies the negative coefficient of skewness of stock return in the next year. The higher the negative coefficient of skewness is, the more likely the company is liable to stock price crash. In addition \( CCC_{it} \) is a measure of working capital management used in the model of Lazaridis (2006).

Descriptive statistics
The mean and the median of the variable the negative coefficient of skewness of stock return, estimated based on Chen’s model et al [6] are 0.6633 and 0.7917, respectively. On the other hand, for cash conversion cycle mean and median are 215.89 and 199.68 respectively. Cash conversion cycle, financial leverage, profitability and standard deviation of monthly returns are skewed to the right. Other variables are almost symmetric. Before applying the regression model and calculation of final model for the study, necessary presupposition tests were applied using the information according to the independent and dependent variables. Results are shown in table 1.(in end of article).

Testing the Research Hypothesis
The table 2 (in end of article) shows the results of the general regression model test assessment in the research. According to this table we can conclude that the main independent variable, working capital management, (+) and among the controlled variables profitability (+), the investors’ opinions heterogeneity (-), conservativeness (+) and the negative coefficient of skewness of the stock return (+) are significant and their directions are shown in the parentheses. The variables profitability and the negative coefficient of skewness are significant at a 90% confidence level and the other mentioned variables are significant at a 95% confidence level.

In interpretation of these variables should be noted that the negative sign (reverse), which means by increasing it, the value of the dependent variable decreases. (Moving toward the negative and increase the likelihood of falling prices) and a positive relationship (direct) means that by increasing it, the value of the dependent variable increases.

To estimate the appropriate model, stepwise regression method has been used. In this method, the independent variables are inserted into the model according to their significance until all the significant variables enter the model. Table 3 shows the results of stepwise regression for determining the appropriate model. To determine the appropriate model, the process of variables significance test has been conducted in 6
steps. The coefficient of determination at the 6th step equals to 0.09 which shows only nearly 1% decrease compared to the complete model. In the other words, in the final model 6 variables out of 10 were significant.
Interpretation of the coefficients indicates that if working capital management increases; the negative coefficient of skewness increases. It means movement toward positive direction and decreases of the possibility of stock price crash. Similar interpretation can be concluded from other coefficients.

CONCLUSION

According to the existing theories, reduction in cash conversion cycle is an ideal position that companies are looking for, and probably will reduce the risk of fall in stock prices. The results obtained from the present research show that there is a positive significant relationship between cash conversion cycle and fall in stock prices, meaning that when the cash conversion cycle decreases, the risk of fall in stock prices also decrease. Cash conversion cycle implies the time needed for the funds to be converted to a product during the regular operation of the company. Reducing this period means that to produce a certain product less cash is required. A company can decrease the cash conversion cycle by shortening the period in which cash in the form of inventory or shortening the time required for collection of receivables. Lower the cash conversion cycle means company is in better financial position. Therefore, if a company keeps high amount of current assets, the profitability of the company will be weakened. This can be due to the fact that keeping high amount of current assets such as inventory can increase the cost of maintaining materials and also insurance fees. Also increase in credit sales can increase the risk of not receiving receivables which can lead to debt financing and increasing the interest cost. According to the results obtained from this research it is recommended to financial managers to take into account the advantage and disadvantages of reducing the cash conversion cycle to efficiently manage the working capital because excessive reduction of cash conversion cycle can adversely affect the ability of company to pay its due debts which can lead to decrease in company’s credit rating and increase the risk of bankruptcy and finally fall in stock prices.

Table 1. The results of regression test

<table>
<thead>
<tr>
<th>Default</th>
<th>Type of test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residuals are normal</td>
<td>Kolmogorov-Smirnov</td>
<td>Values 0.05 for significant level of negative coefficient skewness from 1998 to 2011 is higher than 0.05 and therefore can be concluded that the amounts remaining in the regression line are normally distributed.</td>
</tr>
<tr>
<td>Homogeneity of variance</td>
<td>graph of residual values versus Durbin-Watson</td>
<td>Scattered in almost all random graphs and not pattern. 2.018 values close to 2 indicate a correlation of their residuals.</td>
</tr>
<tr>
<td>Their lack of correlation between residuals</td>
<td>Dispersion curves</td>
<td>In some, linear relationship was good, in others there is no significant relationship.</td>
</tr>
<tr>
<td>There is linear relationship and there are no influential points</td>
<td>VIF statistics</td>
<td>These values for estimating model are calculated and in all cases less than 5.1</td>
</tr>
</tbody>
</table>

REFERENCES


Chen J, Hong H. et al.2001. *Forecasting crashes: trading volume, past returns, and conditional skewness in stock prices*.


Hong H, Stein JC. 2003. *Differences of opinion, short sales constraints, and market crashes*.


Table 2. Coefficients of model

<table>
<thead>
<tr>
<th>Coefficient Model</th>
<th>Nonstandard Coefficients</th>
<th>Standardized coefficients</th>
<th>t statistic</th>
<th>Significant level</th>
<th>The linear statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant value</td>
<td>1.47</td>
<td>0.49</td>
<td>2.69</td>
<td>0.006</td>
<td>-</td>
</tr>
<tr>
<td>working capital management</td>
<td>0.002</td>
<td>0.000</td>
<td>1.98</td>
<td>0.154</td>
<td>1.57</td>
</tr>
<tr>
<td>Profitability (t+1)</td>
<td>0.29</td>
<td>0.11</td>
<td>2.28</td>
<td>0.017</td>
<td>1.16</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.08</td>
<td>0.07</td>
<td>0.12</td>
<td>0.879</td>
<td>1.039</td>
</tr>
<tr>
<td>Heterogeneity of investor beliefs</td>
<td>6.12</td>
<td>2.68</td>
<td>2.34</td>
<td>0.032</td>
<td>1.054</td>
</tr>
<tr>
<td>Conservatism</td>
<td>0.94</td>
<td>0.47</td>
<td>2.018</td>
<td>0.048</td>
<td>1.189</td>
</tr>
<tr>
<td>Cash convention cycle</td>
<td>0.032</td>
<td>0.095</td>
<td>2.07</td>
<td>0.042</td>
<td>1.066</td>
</tr>
<tr>
<td>Average monthly return</td>
<td>1.18</td>
<td>1.39</td>
<td>0.851</td>
<td>0.359</td>
<td>1.541</td>
</tr>
<tr>
<td>negative coefficient skewness</td>
<td>0.19</td>
<td>0.05</td>
<td>3.75</td>
<td>0.000</td>
<td>1.144</td>
</tr>
<tr>
<td>Coefficient of determination</td>
<td>0.099</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted coefficient of determination</td>
<td>0.081</td>
<td>5.383</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson statistic</td>
<td>2.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Estimated model and its coefficient

<table>
<thead>
<tr>
<th>Coefficient Model</th>
<th>Nonstandard Coefficients</th>
<th>Standardized coefficients</th>
<th>t statistic</th>
<th>Significant level</th>
<th>The linear statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant value</td>
<td>0.619</td>
<td>0.139</td>
<td>4.748</td>
<td>0.000</td>
<td>-</td>
</tr>
<tr>
<td>negative coefficient skewness</td>
<td>0.185</td>
<td>0.048</td>
<td>3.836</td>
<td>0.000</td>
<td>1.014</td>
</tr>
<tr>
<td>Profitability (t+1)</td>
<td>0.345</td>
<td>0.127</td>
<td>2.787</td>
<td>0.006</td>
<td>1.031</td>
</tr>
<tr>
<td>lack of Transparency of financial information</td>
<td>0.658</td>
<td>0.323</td>
<td>2.037</td>
<td>0.042</td>
<td>1.055</td>
</tr>
<tr>
<td>Heterogeneity of investor beliefs</td>
<td>6.647</td>
<td>2.68</td>
<td>2.48</td>
<td>0.013</td>
<td>1.005</td>
</tr>
<tr>
<td>Cash convention cycle</td>
<td>0.002</td>
<td>0.000</td>
<td>4.851</td>
<td>0.95</td>
<td>1.034</td>
</tr>
<tr>
<td>Coefficient of determination in the sixth stage</td>
<td>0.842</td>
<td>0.419</td>
<td>2.01</td>
<td>0.045</td>
<td>1.005</td>
</tr>
</tbody>
</table>

Estimated model:

\[ NC\text{SKEW}_{t+1} = 0.711 + 0.002CC\text{C}_{t+1} + 0.416ROE_{t+1} - 7DT\text{URN}_{t} + 0.864\text{CONSER}_{t} + 0.045NC\text{SKEW}_{t} + 0.582\text{PAQUE}_{t} \]

\[ \text{Durbin-Watson statistic} = 2.018 \]