The influence of working capital management, considering restrictions of financing on the sensitivity investment cash flow

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ABSTRACT

It is very important to have a proper knowledge and understanding of the factors effective in decision makings by managers regarding the fixed investment and capital costs due to their effects on the performances of the companies. The present research is going to study the effect of investing in fixed capital regarding the limitations of financing on the sensitivity of cash flows. To analyze the data we will use a regression model. The time period for the present research started from the beginning of the year 1385 (21st March 2006) up to the end of the year 1390 (20th March 2011) and the statistical sample of the research was collected by using the systematic deletion method including 70 companies from among companies present in Tehran Stock Exchange. The results of the present research showed that the effect of fixed investing, regarding the limitations of financing such as firm size, firm age, the ratio of dividends, financial leverage, and the business group on the sensitivity of cash flows is not meaningful but it has a positive and meaningful effect.

Key words: Capital costs, Limitations of financing, Sensitivity of cash flow

INTRODUCTION

Making decisions about investing is a composition of science and art. To achieve success in investing we should imagine what may happen. We know about what has happened before but we cannot say that past tense will happen again. Although future accompanies uncertainty it can be managed and the investors can get enough consciousness by using the principles of investing (Tehrani & Nourbakhsh, 2012). In the challenging economics atmosphere through which the international organizations are seeking new ways to grow and improve financial performance and reduce risk, flowing capital is considered as an important resource to improve financial performance. Thus, an active flowing capital management is a basic requirement of the ability of an organization in a challenging economy. The goal of flowing capital management is to establish a sensitive equilibrium between preserving liquidity to support daily operations and maximization of short-term investing opportunities (Filbeck et al., 2007). Flowing capital management can be accessed through several different ways. We can refer to inventory management, accounts receivable management, and accounts payable management from among its main constituents which represent the cash change cycle (Deloof, 2003). The broad literature in this field shows that flowing capital management affects liquidity, profitability, and debt payoff ability of the company.
directly (Enqvist et al., 2011). Business units should consider the amount or limitation of their investments regarding the limitations of resources in investing for different projects (Modarres & Hesarzadeh, 2008). When companies encounter financial limitations there exists a gap between internal and external financing costs and this gap is called financial limitations. The company which encounters more problems in accessing the external resources of the capital market will utilize a more excessive part of its internal financial resources for financing. Such a company is technically called a company suffering from financial limitations. The reliance amount of a company to its internal resources is determined through its investing sensitivity to the cash flows of the company (Fazari et al., 1988). One of the issues posed in investments is financing for these investing projects. Regarding the asymmetrical information mechanism existence in capital markets, financing cost will be different using internal or external resources and the existence of asymmetrical information between managers and creditors regarding cash flows, future perspectives, and the real value of the company will result in more expensive amounts of external financing compared with the internal ones (Arsalan et al., 2006). Thus, financial managers in business units rely more on internal resources for financing their investment projects. Investing cash flow sensitivity is defined through the amount of the changes made in capital costs of the company for each unit of change in cash flow (Farazi & Hubard, 1988). Accordingly the higher amount of capital cost sensitivity to cash flows in a corporation will result in more reliance of that company on the internal resources and therefore there exists financing limitation (Arsalan et al., 2006). Thus, the present research is going to assess the effect of flowing capital management regarding the limitations of financing on cash flow sensitivity aiming at making the results useful for managers' decision making, investors, government, creditors, and others.

Theoretical foundations and research literature:

Flowing capital management shows the policies and decisions which are applied in flowing capital sector in order to change all different current resources of short-term financing (Izadinia & Taki, 2010). Those companies are apt to financing limitations which have low and costly access to financing resources (Kashanipour & Naghinejad, 2009). The existence of internal and external financing limitations have had a different effect on investing sensitivity compared to cash flows and different theories have been devised during the recent years by Farazi & et al, Kaplan & Zinglass, and Govariglia. Based on such a thought they proposed an index entitled investing cash flow sensitivity. This index is defined as the assessment of cash flow investing sensitivity. This index is defined through measuring the amount of changes in capital costs of the company for each change unit in cash flow. In theory and practice several criteria have been utilized as the indexes to show the existence of financial limitations. The present research has used the traditional criteria of firm size, firm age, the ratio of dividends, and leverage as the criteria to show the existence of financial limitations (Arabsalehi & Ashrafi, 2011). Riis Flor and Hirth (2013) analyzed how the liquidation of financial assets and physical assets affect investing of the companies in a research entitled: "liquidation of assets, investing of companies and internal financial supply costs". Their findings showed that the amount of sensitivity is determined by liquidation of assets of the company. Thus, assets' liquidation is considered as an important factor in investing by the companies. Ding et al (2012) studied the relationship between investing in fixed capital, flowing capital, and financing limitations in their research. The results showed that those companies which had had low sensitivity towards fixed investment in their cash flows and also those companies which had had high sensitivity towards investing in flowing capital on cash flows had been under external financial limitations extremely and they found out that the consistency in investing levels should be preserved mostly with flowing capital because the fixed capital and an active management in flowing capital can be an equipment to get released from financing limitations. Arabsalehi and Ashrafi (2011) studied the relationship between financial limitations and cash flow investing sensitivity. To categorize the companies into two groups of those having financial limitations and those without financial limitations, the amount of cash reservoirs of the companies were considered as the main categorizing variable. The financial information of 72 firms accepted in Tehran Stock Exchange during the time period between
1999 and 2008 was accessible. The research findings showed that cash reservoirs have had a positive role in reducing cash flow investing sensitivity of the companies. Enqvist et al (2011) investigated about the effect of flowing capital management on firms' profitability in different business cycles. The results showed that there is a negative relationship between cash changing cycle and firms' profitability. Also the results showed that those companies can control inventories more efficiently and reduce taxation receipt time and reduce the time needed to get the opportunities and shorter-term accounts payable to achieve more profitability. Hovakimian (2009) selected a sample comprising 7176 companies for the time period between 1985 and 2003 after controlling firm size, financial leverage, growth opportunities, and the percentage of dividends policy as the financial limitations which showed that capital costs are sensitive to cash flows. Kashanipour and Naghinejad (2009) compared cash flow investing sensitivity and cash flow investing sensitivity of cash as the criteria of financial limitation in a research entitled: "Studying the effect of financial limitations on cash flow investing sensitivity of cash". The sample used by them entailed 78 companies for the time period between 2001 and 2006. They tested the meaningfulness of the coefficients of the equation of optimized cash reservoirs and concluded that investing cash flow sensitivity is a more appropriate criterion than cash flow sensitivity of cash to recognize the financial limitations. Meanwhile, they did not use the equation of optimized cash reservoirs for categorizing the companies.

**Research hypothesis:**

1- Claim's collection period effects investing cash flow sensitivity regarding the limitations of financing.

2- Creditors' payment period effects investing cash flow sensitivity regarding the limitations of financing.

3- Inventory flowing period effects investing cash flow sensitivity regarding the limitations of financing.

4- Inventory flowing period effects investing cash flow sensitivity regarding the limitations of financing.

**MATERIALS AND METHODS**

**Research variables**

**Independent variables:**

**Claims' collection period:** the time period to collect the claims of the company.

Claim's collection period = average accounts receivable/ net sales income * 365.

The payment of creditors' period: the time period it takes to pay accounts payable

Creditors' payment period = average accounts payable/ cost of sales income * 365.

Inventory flowing period: the time period it takes to sell the ideas.

Inventory flowing period = average accounts payable/ cost of sold food * 365.

Cash transfer cycle: cash transfer cycle refers to the time between the expenditures of a company to supply raw material to get cash money resulting from the sales of the completed (Yaghoubnejhad et al., 2010).

Cash transfer cycle = Inventory flowing period + Claim's collection period - Creditors' payment period
**Dependent variable:** it is cash flow investing sensitivity of cash.

In most researches carried out about the issue investing sensitivity to cash flow has been investigated based on the investing regression to cash and Tobin (Hovakimin, 2010). The investing model is defined as follows:

\[ INV = \alpha + \beta_1 \text{CFLOW}_{it} + \beta_2 Q + \epsilon_i \]

Where, \( i \) shows the company (location dimension) and \( t \) represents the year (time dimension). INV shows investment and is measured by using the ratio of capital costs in fixed assets on net assets of the start of the period. CFLOW represents cash flow and is calculated by using net cash flows resulting from operational activities on net assets of the start of the period. \( Q \) represents growth opportunities (Q Tobin) and equals to book value of total liabilities plus market value of owners' equity divided by book value of total assets. \( \beta_1 \) is the coefficient of cash flow and represents cash flow investing sensitivity.

**Controlling variable:** financing limitations are control variables which include: firm size, firm age, the ratio of dividends, business group, and financial leverage.

**Firm size:** firm size can represent the ability of management and the quality of accounting plans. To measure firm size we have used the natural logarithm of book value of total assets (George et al, 2008).

**Firm age:** to measure firm age we have used the number of the years passed from the establishment year of the company (Arsalan et al, 2006).

**The ratio of dividends:** to measure the ratio of dividends we have used the dividends paid during the fiscal year on book value of total assets of the start of the period (Arsalan et al, 2006).

**Financial leverage:** financial leverage is the amount of using liabilities for financing assets. Financial leverage is calculated by dividing total liabilities of the company into total assets of it (George et al, 2008).

**Data Collection**

The present research is applied regarding its goal and it is quasi-experimental regarding administration method and it is post-incidental regarding positive accounting researches and it is based on real information. To collect the items about literature review we have used library method and computer websites. To collect the needed data to calculate research variables we have used Rahaward-e-Novin 3 database and the formal website of Tehran Stock Exchange.

**Statistical population of the research**

The location range of the present research entails firms accepted in Tehran Stock Exchange during the time period between 2006 and 2011. The statistical population of the present research includes all firms accepted in Tehran Stock Exchange which have been accepted in bourse before March 2006 and their trademarks did not stop until the end of the year 2011. Based on the studies carried out the number of the sample in this research included 70 companies observed with the following characteristics:

1- To observe their comparability the fiscal year for the companies ended 21st March (end of Esfand).

2- The companies didn't have stopped their activities during the period under investigation and they have not changes their fiscal year.

3- The data needed about the companies during the study period should have been accessible.

4- The companies shouldn't be among banks, insurance companies or investing and leasing companies.
Data analysis method

In the present research we have used the regression method to analyze the data and approve or reject the hypotheses. The data analysis was carried out by using Stata software and generalized moment method (GMM). In integrated data model when the dependent variable appears in right side other estimators of OLS are not compatible (Hishao, Arlano and Band and Baltaci, 1995) and we should utilize two step estimation methods (2SLS) of Anderson and Hishao or generalized moment method (GMM) of Arlano and Band (1991). As Matias and Suster pointed out (2SLS) estimation may result in great variances for the coefficients due to the problems in choosing the tools and the estimations would not be meaningful statistically. Thus, generalized moment method (GMM) of Arlano and Band was proposed to solve this problem. This estimator increases estimation consistency through the reduction of sample. Also we have used first order self-correlation tests and Wald's and Sargan's tests.

RESULTS

Descriptive statistics

The descriptive statistics of the research are shown in table 1.

Table 1: The descriptive statistics related to independent and dependent variables of the research

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Average</th>
<th>Criterion deviation</th>
<th>min</th>
<th>max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm size</td>
<td>8.007</td>
<td>3.67</td>
<td>0.61</td>
<td>5.89</td>
<td>5.8</td>
</tr>
<tr>
<td>Firm's age</td>
<td>46</td>
<td>1</td>
<td>9.25</td>
<td>13.12</td>
<td>11</td>
</tr>
<tr>
<td>Financial leverage</td>
<td>8.65</td>
<td>0.0006</td>
<td>0.55</td>
<td>0.67</td>
<td>0.64</td>
</tr>
<tr>
<td>Ratio of dividends</td>
<td>0.49</td>
<td>1.32e-08</td>
<td>0.033</td>
<td>0.004</td>
<td>0.0007</td>
</tr>
<tr>
<td>Inventory period flowing</td>
<td>12373.2</td>
<td>3.34</td>
<td>721.2</td>
<td>253.04</td>
<td>176.93</td>
</tr>
<tr>
<td>Claim's collection period</td>
<td>8448.69</td>
<td>0.84</td>
<td>577.17</td>
<td>210.13</td>
<td>126.68</td>
</tr>
<tr>
<td>Creditors' payment period</td>
<td>6375.95</td>
<td>0.52</td>
<td>412.05</td>
<td>131.31</td>
<td>59.48</td>
</tr>
<tr>
<td>Cash transfer cycle</td>
<td>12841.72</td>
<td>-1881.86</td>
<td>940.41</td>
<td>331.86</td>
<td>247.54</td>
</tr>
<tr>
<td>Cash flow</td>
<td>59.63</td>
<td>-7.07</td>
<td>3.13</td>
<td>0.86</td>
<td>0.49</td>
</tr>
<tr>
<td>Growth opportunities</td>
<td>8.89e07</td>
<td>1038.83</td>
<td>9722181</td>
<td>2315149</td>
<td>376365.1</td>
</tr>
</tbody>
</table>
Measurement method of the sensitivity of cash flow:

In the present research we have used Hovakimian's (2010) model to measure the sensitivity of cash flow as follows. The results of adjusting the model above are shown in the table below.

\[ \text{INV} = \alpha + \beta_1 \text{CFLOW}_i + \beta_2 Q + \varepsilon_i \]

**Table 2:** Results of estimating the basic model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficients</th>
<th>Criterion deviation</th>
<th>T statistics</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash flows</td>
<td>-18568.59</td>
<td>8939.31</td>
<td>-2.08</td>
<td>0.03</td>
</tr>
<tr>
<td>Growth opportunities</td>
<td>0.11</td>
<td>0.041</td>
<td>2.72</td>
<td>0.006</td>
</tr>
<tr>
<td>Latitude from the base</td>
<td>465571</td>
<td>154269.1</td>
<td>3.02</td>
<td>0.003</td>
</tr>
<tr>
<td>Number of observations</td>
<td>416</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(R^2)</td>
<td>0.46</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Limer</td>
<td>4.96</td>
<td></td>
<td></td>
<td>0.000</td>
</tr>
<tr>
<td>Husman</td>
<td>1.47</td>
<td></td>
<td></td>
<td>0.22</td>
</tr>
</tbody>
</table>

Based on the results gained it was found that the probability of F Limer statistics has been less than 0.05 and thus tableau data method was chosen. Also regarding Hausman's test random effects method was chosen. The results of estimations shown in table 2 showed that cash flow and growth opportunities are meaningful in 0.05 levels. Thus, we can say that the variables above have had negative and positive effects on investing, respectively.

**Testing the hypotheses:**

**Testing the first hypothesis:** based on the first hypothesis it was pointed out that claims' collection period affects investing cash flow sensitivity regarding the limitations of financing. The presupposition above was tested by using the research model in tableau data level and the results were represented in table 3.

\[ \text{CFS} = \alpha + \beta_1 \text{mar} + \beta_2 \text{FL} + \beta_3 \text{AGE} + \beta_4 \text{SIZE} + \beta_5 \text{DR} + \varepsilon \]

**Table 3:** Results of estimating model (1)

<table>
<thead>
<tr>
<th>Descriptive variables</th>
<th>Coefficients</th>
<th>Z statistics</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing</td>
<td>0.19</td>
<td>67.55</td>
<td>0.000</td>
</tr>
</tbody>
</table>
The results of the estimated coefficients showed that the percentage of investment with an interruption equals 0.19. It means that there is a positive relationship between this descriptive variable and the dependent variable. According to the results of the model estimation, accounts receivable collection period is meaningful. Thus, the research hypothesis claiming the effect of accounts receivable collection period on investing cash flow sensitivity regarding financing limitations is approved. It should be noted that the variables of firm size and financial leverage are meaningful and affect investing cash flow sensitivity. But the variables age, dividends ratio are not meaningful and do not affect investing sensitivity.

**Testing the second hypothesis:** based on the second hypothesis it was pointed out that claims' flowing period affects investing cash flow sensitivity regarding the limitations of financing. The presupposition above was tested by using the research model in tableau data level and the results were represented in table 4.

\[
CFS = \alpha + \beta_2 \text{minv} + \beta_3 \text{FL} + \beta_4 \text{AGE} + \beta_5 \text{SIZE} + \beta_6 \text{DR} + \varepsilon
\]

**Table 4:** Results of estimating model (2)

<table>
<thead>
<tr>
<th>Descriptive variables</th>
<th>Coefficients</th>
<th>Z statistics</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing stop</td>
<td>0.29</td>
<td>110.88</td>
<td>0.000</td>
</tr>
</tbody>
</table>
The results of the estimated coefficients showed that the percentage of investment with an interruption equals 0.29. It means that there is a positive relationship between this descriptive variable and the dependent variable. According to the results of the model estimation, inventory flowing period is not meaningful. Thus, the research hypothesis claiming the effect of inventory flowing period on investing cash flow sensitivity regarding financing limitations is rejected. It should be noted that the variables of firm size and financial leverage are meaningful and affect investing cash flow sensitivity. But the variables age, dividends ratio are not meaningful and do not affect investing sensitivity.

**Testing the third hypothesis:**

Based on the third hypothesis it was pointed out that creditors’ collection period affects investing cash flow sensitivity regarding the limitations of financing. The results were represented in table 5.

\[ \text{CFSI} = \alpha + \beta_1 \text{map} + \beta_2 \text{FL} + \beta_3 \text{AGE} + \beta_4 \text{SIZE} + \beta_5 \text{DR} + \varepsilon \]

**Table 5:** Results of estimating model (3)

<table>
<thead>
<tr>
<th>Descriptive variables</th>
<th>Coefficients</th>
<th>Z statistics</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing stop</td>
<td>0.30</td>
<td>46.36</td>
<td>0.000</td>
</tr>
<tr>
<td>Creditors’ payment period</td>
<td>114.0167</td>
<td>2.62</td>
<td>0.009</td>
</tr>
<tr>
<td>Firm’s age</td>
<td>-20712.24</td>
<td>-0.61</td>
<td>0.54</td>
</tr>
<tr>
<td>Firm size</td>
<td>252051.3</td>
<td>3.78</td>
<td>0.000</td>
</tr>
</tbody>
</table>
Ratio of dividends | -201685.6 | -0.37 | 0.71
---|---|---|---
Financial leverage | 49095 | 3.64 | 0.000

Model testing statistics

| First order self-correlation test | AR(1) | -1.1149 | 0.26
---|---|---|---
| Second order self-correlation test | AR(2) | 0.86553 | 0.39
| Wald test statistics | 12175.42 | 0.0000
| Sargan test statistics | 17.099 | 0.11

The results of the estimated coefficients showed that the percentage of investment with an interruption equals 0.20. It means that there is a positive relationship between this descriptive variable and the dependent variable. According to the results of the model estimation, creditors' collection period is meaningful. Thus, the research hypothesis claiming the effect of creditors' collection period on investing cash flow sensitivity regarding financing limitations is rejected. It should be noted that the variables of firm size and financial leverage are not meaningful and do not affect investing cash flow sensitivity. But the variables age, dividends ratio are not meaningful and do not affect investing sensitivity.

**Testing the fourth hypothesis:**

Based on the third hypothesis it was pointed out that creditors' collection period affects investing cash flow sensitivity regarding the limitations of financing. The results were represented in table 6.

\[ \text{CFSI} = \alpha + \beta_1\text{CCC} + \beta_2\text{FL} + \beta_3\text{AGE} + \beta_4\text{SIZE} + \beta_5\text{DR} + \epsilon \]

**Table 6:** Results of estimating model (4)

<table>
<thead>
<tr>
<th>Descriptive variables</th>
<th>Coefficients</th>
<th>Z statistics</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing stop</td>
<td>0.30</td>
<td>108.88</td>
<td>0.000</td>
</tr>
<tr>
<td>Cash transfer cycle</td>
<td>-1460019</td>
<td>-0.49</td>
<td>0.62</td>
</tr>
<tr>
<td>Firm's age</td>
<td>-46737.94</td>
<td>-5.24</td>
<td>0.000</td>
</tr>
<tr>
<td>Firm size</td>
<td>280506.8</td>
<td>3.52</td>
<td>0.000</td>
</tr>
<tr>
<td>Ratio of dividends</td>
<td>474495.6</td>
<td>1.81</td>
<td>0.070</td>
</tr>
<tr>
<td>Financial leverage</td>
<td>46726.11</td>
<td>4.24</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Model testing statistics

| First order self-correlation test | AR(1) | -1.1347 | 0.26
---|---|---|---
The results of the estimated coefficients showed that the percentage of investment with an interruption equals 0.30. It means that there is a positive relationship between this descriptive variable and the dependent variable. According to the results of the model estimation, cash transfer period is not meaningful. Thus, the research hypothesis claiming the effect of cash transfer period on investing cash flow sensitivity regarding financing limitations is rejected. It should be noted that the variables of firm size and financial leverage are not meaningful and do not affect investing cash flow sensitivity. But the variables age, dividends ratio are meaningful and affect investing sensitivity.

Conclusion

In the present research it was presupposed that flowing capital management criteria which include claim's collection period, inventory flowing period, cash transfer cycle, and creditors' payment period affect investing cash flow sensitivity regarding the financing limitations. We utilized Hovakimian's (2010) model to measure investing cash flow sensitivity. Also to calculate the effects of financing limitations we have used 5 criteria of firm size, firm age, financial leverage, and dividends ratio. The research results showed that from among the criteria of flowing capital management criteria, the criteria of claims' collection period and creditors' payment period have had positive and meaningful effects on investing cash flows sensitivity regarding financing limitations and thus we can interpret that by increasing the variables above the sensitivity amount of cash flow investing increases and vice versa. But the variables of inventory periods and cash transfer cycle did not have any effects on investing cash flow sensitivity.

REFERENCES


