

THE EFFECT OF DEBT, FIRM SIZE AND LIQUIDITY ON INVESTMENT CASH FLOW SENSITIVITY OF LISTED COMPANIES IN TEHRAN STOCK EXCHANGE

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Abstract

This study examines the relationship between some variables (debt, firm size and liquidity), the cash flow sensitivity of investment companies listed in Tehran Stock Exchange, will be examined. Specifically, this study aimed to investigate the hypothesis that the cash flow sensitivity of investment In order to investigate this objective, three main hypotheses and selecting the 100 companies among the listed companies in Tehran Stock Exchange during the five-year returns, 2008 to 2012, have been tested. The aim of the present research applied descriptive - correlation. And to test hypotheses using panel data regression models are combined. Results of statistical analysis, hypothesis, research shows that between debt and cash flow sensitivity of investment is an inverse relationship And significant relationship between firm size and sensitivity and positive cash flow investment there. Also, the company's liquidity and cash flow sensitivity of investment is statistically significant and positive.

Keywords: *debt, firm size, liquidity, cash flow sensitivity of investment*

INTRODUCTION

Discussion about financial constraints is one of the main issues facing all companies. Conventional methods for investigating the relationship between financial constraints, the value of cash, and investment of divided companies into two groups, corporations with financial constraints and with no financial constraints. Fazzare & et al argue that companies that have severe financial constraints, during investment decisions emphasize more on cash flows. In other words, by increasing the difference between internal and external financing costs increased the sensitivity of investment to internal cash flows (Fazaare, Habardoptrsn, 1988).

One of the modern standards of recognizing financial constraints is the amount of cash reserves (cash balance of its equivalent) available in the company. It is expected that companies "with

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financial constraints" to insure themselves against future investment need to take cash flow storage (Almeida & et al, 2004). Although the cash maintained in the balance sheet is accounted an important asset for the company, maintenance of these assets too much can be a sign of lack of efficiency of resource allocation and impose the costs to the company. Some of the costs include the opportunity cost of capital and agency costs associated with supervision. The most important factor in maintaining cash surplus is the problems caused by information asymmetry (Subramaniam & et al, 2011).

Cash flow sensitivity of investment is considered as one of the components of financial decisions. Because, the ability of the company's investment can affect in such a way the financing of company and as a result it is considered a kind of financial decision. The question that arises in the literature is that how do financial sensitivity effect on the investment decisions of companies? Empirically, in the market capitalization to the extent that the return on investment is equal to the cost of capital, firms will invest (Hayashi, 1982).

Accordingly, while the Company's ability to raise funds for their own in chance by good profits, they will invest. In cases where there is financial sensitivity and corporate faced with financing constraints, investments will also be affected by the company's liquidity (Fazaare, Habardoptrsn, 1988). Up to now investigating the effect of financial constraints on policies and procedures of the investment and financing of corporate is one of the controversial issues among researchers. This scope of the accounting researches is segregated into two major categories to investigate the effect of financial constraints on the investment cash flow sensitivity and the effect of financial constraints on cash flow sensitivity. Investment cash flow sensitivity refers to the percentage change in the company's capital expenditure in respect of changes in cash flows.

Currently the change in operating cash flow as a source of cash flow of companies has a significant impact on asset and capital structure, including cash flow holdings, investment and external financing. So that an increase in firms cash flow in the short term cause to increase savings and reduce external financing and increases in long-term investment and external finance. Because the firms where the cash flow is maintained attempt to provide reasonable investment, but because the funds are not enough savings for investment projects inevitably they forced borrowing. In addition to these companies, a major portion of the funds held in short-term instead of paying out dividends or capital expenditures are allocated preferentially to reduce financing. So that, in the current period the reduction in external financing caused to increase future financing capacity. For this reason, in the short term companies before allocating cash for future investment projects attempted to reduce financing.

As noted above, the cash flow sensitivity of investment, as changes in capital expenditures for the changes is defined in the cash flow bills. In other words, the level of company reliance on its own internal resources measure with the investment cash flow sensitivity criteria. Therefore, it is expected that firms with reliance on its own resources are less likely to borrow through debt i.e the negative relationship and as well the investment cash flow sensitivity in large companies is greater than small companies the positive relationship. Also we expected that to be positive relationship between the company's liquidity and investment cash flow sensitivity.

Therefore, research hypothesis is stated as follows:

- There is positive and significant relationship between company's debt and investment cash flow sensitivity.
- There is positive and meaningful relationship between firm size and investment cash flow sensitivity.

- There is positive and meaningful relationship between liquidity of companies and investment cash flow sensitivity.

METHODOLOGY

Since the purpose of this study was to evaluate the impact of the debt, firm size and liquidity on investment cash flow sensitivity, according to the nature of the method that used in this study is a descriptive - correlation study.

The population of this study consisted of companies listed in Tehran Stock Exchange from 2007 to the end of 2012, served in the Tehran Stock Exchange. Quality of the information together with the ease of access to financial information and other information is the most important reason for choosing this target population.

Due to the nature of research and also some inconsistencies among the listed companies in Tehran Stock Exchange was used the removal systematic sampling (purposive).

In order to determine the statistical community of this study the following conditions has been considered:

(1) Not to be member of banks, financial institutions, investment, holding and leasing company and not because of the nature of their specific activities, the examined factors relationship in this study varies for such institutions and cannot be generalized to other

(2) To observe the ensure comparability, the financial year of firm should be ending on March 29 of each year.

(3) The company does not have financial year during 1386 to 1390 and in mentioned financial years should not be unprofitable. Also the book value of shareholders should not be negative during the case study.

(4) The financial statements of these companies should be available.

By considering the above conditions, 100 firms were selected as the sample for the period 1386 to 1390. In the present study, according to the type of data and methods of analysis, the combined data was used. By using multiple linear regression, the statistical hypothesis test was performed in ordinary least squares method. Statistical analysis was conducted using software such as Excel version 2010, Stata version 1.9 and E-views version 7.

Chow statistic was used to assess the significance of the whole model and the t-statistic was used to evaluate the significant difference in the coefficients of the independent variables and in confidence level 95% decided over to accept or reject the hypothesis.

RESULTS

Descriptive statistics of variables used in this study are presented in Table (1)

Table 1 - Descriptive statistics of variables

Variables	No.	Mean	Standard Deviation	Strain	Skewness
Cash flow sensitivity of investment	500	.214	1.07	1.592	6.87
Current & Non-current Liabilities	500	.599	.154	-.427	-.168
Size of Company	500	13.55	1.30	.929	1.415
Cash	500	.616	.072	3.179	12.729
Cash Flow	500	.154	.136	.559	1.907

The findings show the highest and lowest mean is related to company size and cash, respectively. Furthermore, the cash variable has lowest standard deviation (dispersion of average) firm size variable has the highest standard deviation (dispersion of average).

Research Hypotheses Test

1-Pattern Selection Test

Table (2) shows the results of the pattern selection for each one of the research hypotheses

Table 2: results of the pattern selection to test each of the hypotheses

Appropriate model	The main hypothesis		Test	Hypotheses
	(sig.)	F statistics		
Panel	0.000	6.99	The Chow test	The first hypothesis
Panel	0.000	6.93	The Chow test	The second hypothesis
Panel	0.000	5.32	The Chow test	The third hypothesis

As it shows, to test the three hypotheses, since the significance level of Chow test is less than the acceptable error level (5%) Therefore, the null hypothesis was rejected based on the equality of intercept from sources and the opposite hypothesis was accepted. Hence, in this phase, the researcher should analysis the panel pattern of the fixed effects against the panel pattern of the random effects. This was carried out by Hausman test which is described in table (3).

Table 3: Results of the pattern selection to test each of the hypotheses

Appropriate model	The main hypothesis		Test	Hypotheses
	(sig.)	F statistics		
Fixed effects	.001	13.03	Hausman test	The first hypothesis
Fixed effects	.037	6.56	Hausman test	The second hypothesis
Fixed effects	.000	37.32	Hausman test	The third hypothesis

As it is observed, from the first to third test hypotheses, since the significance level of Hausman test is less than the accepted error level (5%) thus, the null hypothesis that there is no correlation between explanatory variables and the individual effects is rejected and the opposite hypothesis was accepted. This value indicates that it should be used the fixed effects method. Then the regression test was done data method of panel- fixed effects.

2-The first hypothesis test

This study aimed to test the first hypothesis that whether there was any positive and meaningful relationship between the corporate debt and investments cash flow sensitivity of the listed companies in Tehran Stock Exchange or not?

In Table 4 the results of model estimation as well as the results of statistics and assumptions of classical regression are presented.

Table 4 the results of the first hypothesis test by estimating research model (1)

Dependent variable: the cash flow sensitivity of investment

Number of observations: 500

Variables	Coefficient	t statistics	Significant level.
Latitudes of the source	0.041	31.54	.000
Current and Non- Current Liabilities	-.492	-3.904	.004
Cash Flow	.152	3.863	.000
Adjusted R ²	.552		
F-statistic	6.885		
sig (F-statistic)	.000		
Durbin-Watson	1.879		

To investigate the significance of overall model, given that the significance (sig) level of F-statistics is smaller than 0/05 (0/000) with 95% the significance of overall models is confirmed. The coefficient of determination of the model also suggests that 55 percent of changes in investments accounted by the variables in the model. Moreover, since the statistic value of Watson camera is a number between 1/5 and 2/5 (1/879), thus the independence of model remaining was confirmed. The significance (sig) level of t-statistics related to the current and non- current debt was smaller than 0/05 and (0/004) and its coefficient is negative (-0/492) so it can be said that there is a negative relationship between the cash flow sensitivity of investments and corporate debt. Consequently, the first research hypothesis is not confirmed at the 95 percent confidence level. In relation to the control variable can be said that according to the results obtained there is direct and meaningful relationship between Cash Flow of firm and Cash flow sensitivity of investment.

3-Second hypothesis test

This study aimed to test whether there was meaningful and positive relationship between the size of the company and the cash flow sensitivity of investment in listed companies in Tehran Stock Exchange or not? Table (5) shows the results of estimating the model as well as the results of statistics and assumptions of the classical regression.

Table 5 Test results of the second hypothesis by estimating second model (2) of research

Dependent variable: the cash flow sensitivity of investment

Number of observations: 500

Variables	Coefficient	t statistics	Significant level.
Latitudes of the source	.041	31.838	.000
size of the company	.324	8.457	.000
Cash Flow	.111	2.950	.003
Adjusted R ²	.565		
F-statistic	.746		
sig (F-statistic)	.000		
Durbin-Watson	1.911		

To estimate the significance level of overall model, given that the significance (sig) level of F-statistics is smaller than 05/0 (0/000), it was confirmed with 95% the significance of the overall

model. Determining coefficient of models also suggest that 56/5 changes in investment explained by the variables in the model. Moreover, since the value of Watson cameras statistic was a number between 1.5 and 2.5 is (1/911), thus the independence of remains of the model was also approved.

The significance (sig) level of t-statistics related to firm size was smaller than 0/05 (0.000) and the coefficient is positive (0/324) so, there was a significant positive relationship between firm size and cash flow sensitivity of investment. Consequently, the second research hypothesis is approved at the 95 percent of confidence level. In relation to the control variable the researcher concluded that according to the results of the research findings there was direct and meaningful relationship between the cash flow of firm and cash flow sensitivity of investment.

4-Third hypothesis test

The purpose of the third research hypothesis was to test whether there was positive and significance relationship between the liquidity of company and cash flow sensitivity of investment in companies listed in Tehran Stock Exchange or not? Table (6) shows the results of estimating the model as well as the results of statistics and assumptions of the classical regression.

Table 6. The Results of the third hypothesis test through the estimating Model (3) of research

Variables	Coefficient	t statistics	Significant level.
Latitudes of the source	.031	15.300	.000
Cash	.085	2.79	.005
Cash Flow	.136	3.885	.015
Adjusted R ²	.507		
F-statistic	6.069		
sig (F-statistic)	.000		
Durbin-Watson	1.886		

To investigate the significant of overall model, given that the significance (sig) level of F-statistics is smaller than 0/05 (0.000) with 95% the significance of overall model was confirmed. Determining coefficient of models also suggest that 50/7 changes in investment explained by the variables in the model. Moreover, since the value of Watson cameras statistic was a number between 1.5 and 2.5 is (1/886), thus the independence of remains of the model was also approved.

The significance (sig) level of t-statistics related to cash was smaller than 0/05 (0.000) and the coefficient was positive ((0/085) so, there was a significant and positive relationship between company cash and cash flow sensitivity of investment. As a result, the third research hypothesis was approved at the 95 percent confidence level. In relation to the control variable the researcher concluded that according to the results of the research findings there was direct and meaningful relationship between the cash flow of firm and cash flow sensitivity of investment.

DISCUSSION AND CONCLUSIONS

Analysis of the first hypothesis

Statistical results and analysis of this hypothesis can be summarized as follow:

-The model is used to prove the hypothesis statistically is significant;

- The rate of adjusted determination coefficient of model is equal to 0.550 i.e, about 0.55 percent of variations of dependent variables explained by independent and control variables.
- The meaningful level of debt variable as independent variables is statistically significant and liabilities has negative meaningful and significance effect on the cash flow sensitivity of investment at 95% confidence level. This means that the increase in debt, the act of operating cash flow for capital expenditure, and the sensitivity of cash flow sensitivity of investment will decline. This means that the increase in debt, the behavior act of cash flow operating had sensitivity to capital expenditure, and In other words, cash flow sensitivity of investment will decrease. As mentioned in the literature, Duchin, Ozbas, and Sensoy (2010), found that with increase in the cost of external finance, companies for the financing of investment projects turn to internal cash flows and thus increase the sensitivity of investment to internal cash flows. Also Agca and Mozumdar, (2008) concluded that firms face with the higher financing constraints the sensitivity of investment to internal cash flows is higher.

Analysis of the second hypothesis

Statistical results and analysis of this hypothesis can be summarized as follows:

- The model used to prove the hypothesis statistically is significant;
- The coefficient determination of adjusted model is equal to 0.565, i.e. 56.5% of the variability of dependent variable is explained by the independent and control variables;

The significant level of firm size variable is meaningful as independent variables. This means that the size has positive and significant impact on cash flow sensitivity of the investment at 95%. Experimental results show that large enterprises face more cash flow sensitivity of investment. These findings are not unique about large enterprises financial constraints against small firms. As mentioned in the research background, the results of this study with the results of Devereux and Schiantarelli (1990), ascribed the positive relationship between the firm size and cash flow sensitivity of investment as information asymmetry and represent problems in large companies.

Kadapakkam, Kumar, Riddick (1998) concluded that, contrary to expectations, larger companies have a higher sensitivity of investment to cash flow. In other words, the investment sensitivity of a company to operating cash flow cannot define as an accurate measure of access to capital market. The results of this study are consistent with Hoseinpur's research finding (2005). He found out that there was a positive relationship between the size, value added, the ratio of dividend, and cash flow sensitivity of investment. The results of this study are inconsistent with Beck et al (2004). They found that there is a negative relationship between the size, age, and company ownership structure, and degree of firm's reliance on internal resources (cash flow sensitivity of investment). Of course it is true that comparing the results of the studies conducted in different places and time, by different people, though it may not seem very good of the scientific aspect, but in terms of expressing the gradual evolution of conducted research in particular topic domain, this issue is important. The results of research carried out at different places and times by different people, inevitably influenced by the different conditions. And the consistency or inconsistency of the results on the same subject cannot ignore these different conditions.

Analysis of the third hypothesis

Statistical results and analysis of this hypothesis can be summarized as follows:

The model used to prove the hypothesis statistically is significant

The coefficient determination of adjusted model is equal to 0.507, i.e. about 50.7% of the changes of dependent variable were explained by the independent and control variables.

Significant level of liquidity variable as independent variables was meaningful. This means that the liquidity of company has positive and significant impact on cash flow sensitivity of investment at a confidence level of 95%. This suggests that the liquidity of the company in general can be seen as a stimulus to investment-cash flow sensitivity. Arsalan et al (2009) found that cash reserves is a useful criteria for determining financial constraints of company and firms with low cash reserves have higher cash flow sensitivity of investment. Companies in response to the momentums of positive cash flow attempt to increase the maintained cash flow in short-term and reduce external financing and in the long term to rational investment and upgrades the external financing. This concept can be concluded that the reaction of companies (companies behavior) to the extra cash from the cash flows input causes dramatic changes on the external financing investment, and therefore on the finance structures and investment of firms. So, for every unit change in operating cash flow, finance structure, and corporate capital increase or decrease one unit.

SUGGESTIONS

- 1- To evaluate cash flow sensitivity of investment should consider the reverse behavioral actions of the corporate debt. Because, the statistical sample companies of this study, would be expected to reduce the company's cash flow sensitivity of investment by increasing corporate debt.
2. The results of the regression models showed that in the short term companies attempt to increase cash flow and reduce external finance and in the long term they use the created financial capacity in order to invest. Therefore, it is recommended to disclosure properly the subject in attachment notes of the financial statements. This will be useful for analysts and users of financial information in the cash flows forecast, and optimal decision making about the entity's operations.

References

1. Agca, T.S., Mozumdar, A., (2008), The impact of capital market imperfections on investment- cash flow sensitivity. *Journal of Banking and Finance*, 32 (2): 207-216
2. Almeida, H., M. Campello and M.S. Weisbach., (2004), the cash flow sensitivity of cash, *Journal of Finance* 59, 1777-1804.
3. Beck, T., Demirguc-Kunt, A., Laeven, L., Maksimovic, V., (2004), The Determinants of Financing Obstacles, *Journal of International Money and Finance* 25, 932-952
4. Devereux, M., Schiantarelli, F., (1990). Investment, Financial Factors, and Cash Flow: Evidence from UK Panel Data. In: Hubbard, R.G. (Ed.), *Asymmetric Information, Corporate Finance, and Investment*, University of Chicago Press and NBER, Chicago, PP. 279-306
5. Fazzare, S., Glenn Hubbard R., Bruce Petersen, (1988), Financing Constraints and Corporate Investment, *Brooking papers on Economic Activity* 1,141-195.
6. George , R., Kabir, R., Jing Q., (2008), Investment – Cash Flow Sensitivity and Financing Constraints: An Analysis of Indian Business Group Firms, available at ssrn.com
7. Hayashi, F., (1982), Tobins Marginal Q and Average Q: A Neoclassical Interpretation, *Econometrica*, 50 (1): 213-224.
8. Kadapakkam, P.R., Kumar, P.C., Riddick, L .A., (1998), The impact of cash flow and firm size on investment: The international evidence, *Journal of Banking & Finance* 22, 293-320

9. Ozkan, A., Ozkan, N., (2004), corporate cash holding: An empirical investigation of UK companies, *Journal of Banking & Finance* 28, 2013-2134
10. Subramaniam, V., Tony T. T., HengYue, X. Zh. (2011). Firm structure and corporate cash holdings, *Journal of Corporate Finance*, No 17,759-773