

## **Investigating The Relationship Between Cash Assets, Sensitivity of Investment Flows and Financing Costs of Listed Companies In Tehran Stock Exchange**

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### **ABSTRACT**

*Cash holding is an identification channel for threat economic unit; accordingly the changes caused by it will affect financing costs and cash flow sensitivity of investment probably. Cash holding reduces the risk of financial crisis and is considered as a safe store for exposure to unexpected losses. In this regard, this research will investigate the relationship between cash holdings, cash flow sensitivity of investment and financing costs on firms listed in Tehran Stock Exchange. In this study, a total of 142 companies listed in Tehran Stock Exchange during 2009-2013 have been investigated. In order to test the hypotheses, linear regression model has been used (pooled). The results show that cash holding has a meaningful relationship with cash flow sensitivity of investment, but has a negative and significant relationship with financing costs.*

*Keywords: cash holdings, cash flow sensitivity of investment, financing costs.*

### **1. INTRODUCTION**

Cash is amongst the most vital resources of every economic unit. Creating balance between the available cash and required cash is an important factor for the economic strength of a business firm and the continuation of its activities. Cash flows have central role in many financial decisions, modelling exchange rates, evaluation methods of investment plans and etc. (Saqafi and Hashemi, 2004). On the other hand, sensitivity of the cash flows has been divided into two categories in accounting studies: the cash flows sensitivity of investments which is related to the percentage of the changes in companies capital expenditures for the cash flows changes and it is our focus in the present study; the second one is the cash flow sensitivity of liquidity that refers to the percentage of the changes in holding cash in the face of changes in the cash flows. Moreover, the cost of debt due to borrowing as a decisive factor in determining the risk information of the creditors and the risk of not the committed obligations can play a major role in creditors' and investors' decisions making process. Considering the importance of the cash assets which with acceptable level of accumulation can lead to flexibility of the economic unit, and also the efficient role of investment flows sensitivity and financing costs in the profitability of the economic unit, the

present study aims at investigating the relationship between cash assets, the investment flows sensitivity and financing costs for the listed companies in Tehran Stock Exchange.

## **2. THEORETICAL FRAMEWORK**

### **2.1 Trade-Off theory and the Pecking – order theory**

Theory of Trade-off (TOT) and Pecking- Order are (POT) two dominant theories of the cash discussion. According to TOT, the optimum level of cash holding is determined by balancing the benefits and the costs of holding cash. Trading motive, precautionary motive and agiotage motive are three main motives of cash holding (Wang, 2005). However, due to the informational imbalance and signalling problems of foreign financing, the Pecking-Order theory follows a financing costs process and internal resources are preferred over the external resources; and in case more financing requires for positive NPV, the debts would be paid off and the cash assets would be accumulated (Johnyet al. 2004). On the other hand, holding the cash inside the company in order to avoid the foreign financing costs in the information imbalance situation might not be optimum for the company (Qorbani and Adili, 2012).

Based on the Balance theory, companies determine their optimum level of cash through equilibrium (balance) between the benefits and costs of cash holding. In fact, they adjust this optimum level by determining the degree of importance of the marginal costs and marginal benefits of cash holding. The manager can make decision with a dynamic approach and based on the cost – benefit analysis of cash holding. In this theory it is assumed that the ratio of the optimum financial leverage exists and any deviation of this ratio (either increase or decrease) is considered as undesirable news in market (Johnny et al. 2004).

### **2.2 Cash holding and financial constraints**

Cash holding reduces the risk of financial crisis and it is considered as secure storages for dealing with unexpected losses, also it gives the opportunity to pursuit the optimal investment policies when the company faces financial constraints and finally it helps to reduce the costs of collecting financial resources or liquidating the available assets. Based on this theory, managers should adjust the cash balance of the company in a way that the marginal benefits of holding cash would become equal with its marginal costs in order to maximize the stockholders wealth (Opleret al. 1999). One of the effective factors on holding cash level is size of the company. Large companies with bank credit can borrow with a better ratio and are able to acquire the necessary funds more easily. Moreover, large companies can always sell unnecessary portions of their assets to obtain cash (Aidin and Neslihen, 2004). Short term decisions such as the

amount of the cash being held and the working capital can have long term effect on the company's value.

### **2.2.1 Investment and cash assets**

Titmen and Howkimian (266) believe that the cash assets have positive relation with investment. That is companies with investment opportunities can focus on the receivable accounts and the function of the received cash in investment. Guplen et al (2012) suggest that the terms of investment with a positive NPV on receiving the probable future assets affect the current investment. Growing body of researches focus on the role of cash assets; Ange and Mike (2011) consider assets sale as a means to distract creditor from the company's value. According to Meyrse and Rajan (1998) economic enterprises are facing a problem known as "Dark Liquidity" and regarding this case, debt liquidation only occurs when the economic enterprise feels the danger of pony and the cash proceeded from the assets sales can benefit the debt holders. Thus companies hold cash in order to deal with unexpected situations and if the financing cost of other factors is high, they use this cash storage to finance their investments.

### **2.3 Cash flow sensitivity to investment**

Recent empirical evidences reveal that the amount of investment can be unsteady and cause more financial constraints, so the cash – investment flows sensitivities can be negative (Bagitet al. 2005). Howakimian (2009) explains the cash – investment flows sensitivities via company's life cycle hypothesis: most of the companies with low liquidity are often young with ambitious projects, so foreign financing is easier for them compared to more mature companies. General views of Bagit et al. (2005) and Howakimian (2009) are based on the fact that companies with low liquidity have high cash – investment flows sensitivity and the scale of sensitivity can be determined by cash assets. Besides, we extract some predictions about the debt financing which is both related to the availability of cash financial assets as well as the division of the real property in liquidation.

## **3. LITERATURE REVIEW**

Dicha et al (2012) studied the asymmetric cash flows sensitivity in companies with financial constraints and companies without financial constraints using the Riddick and whited (2009) model. They found that the companies with negative cash flows have different cash flows sensitivity from the companies with positive cash flows and concluded that the companies with financial constraints have more asymmetric cash flows sensitivity in comparison with companies without financial constraints.

Kingleger and Sadoor (2012) found that low shareholders rights are associated with lower liquidity which is in contrast with agency theory predictions. Huwang et al (2011) investigated the relationship among the agency's cost, high optimism of managers and the cash flows sensitivity. The result of their study showed that the agency's cost and managers' high optimism have positive and significant effect on investment-cash flows sensitivity. Huwakimian (2009) considering an optimum investment model concluded that in shortage of cash situation, managers invest less than the actual requirement of the company. On the contrary, when the liquidity is surplus, investment is more than the company's actual capacity.

Harford et al (2008) examined the relation between cash holding and ownership structure and corporate governance, the results indicate that companies with higher percentage of local ownership and institutional ownership have more cash holding while companies with higher quality of corporate governance and larger board of directors have less cash holding. Almida et al (2004) in a study titled cash flow sensitivity expanded the Opler liquidity model (1999) and the result showed that the liquidity cash flow sensitivity is a more suitable index for identifying the liquidity constraints.

Alyanis and Muzamdar (2004) simultaneously investigated the liquidity cash flow sensitivity and investment – cash flows sensitivity on financial constraints. They found that companies with financial constraints have more cash flow sensitivity in comparison with companies without financial constraints, but liquidity cash flows sensitivity in companies with financial constraints and companies without financial constraints is not meaningful.

## **4. RESEARCH METHODOLOGY**

### **4.1 Research hypotheses**

Based on the literature review and the theoretical framework, we seek the answer of these research questions:

Hypothesis 1:

H0: There is no significant relationship between the cash assets and the investment flows sensitivity.

H1: There is a significant relationship between the cash assets and the investment flows sensitivity.

Hypothesis 2:

H0: There is no significant relationship between cash assets and cost financing.

H1: There is a significant relationship between cash assets and cost financing.

#### 4.2 Population and Statistical sample

The population of the present study is the listed companies in Tehran Stock Exchange for the period of 2009 to 2013. The total number of companies in Tehran Stock Exchange until the end of 2013 is 446 companies which have been selected through the sample screening method. The following terms represented in table 1, were considered for selecting the statistical sample.

Table 1: Sample selection of the present study

The number of the active companies in stock Market until the 2013	466
The number of the companies that have gone out during 2009 - 2013	(116)
The number of the companies enter Stock market during 2009 - 2013	(30)
The number of the companies that their financial year doesn't end at 19 <sup>th</sup> of March (The last day of Solar Hijri calendar)	(65)
The number of companies that have changed their financial year during 2009-2013	(15)
The number of investment companies, brokerage companies, and mutual funds' investments	(52)
The number of companies with incomplete information	(46)
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Total number of studied companies	142

Considering the above mentioned limitation, a total of 142 companies are the statistical sample of this study during years 2009 – 2013.

#### 4.3 Measurement of Variables

Since this study investigates the relationship between the cash assets, investment flows sensitivity and financing costs; investment flows sensitivity and financing costs are the dependent variables and cash assets is the independent variable. Also regarding the previous researches in Iran, the variables such as company size, ownership structure, the ratio of book value to market value of shareholders equity, the ratio of total debt to total assets as the financial leverage and gross

asset value, homogenized machinery and equipment with the company's assets were considered as control variables.

- Cash Assets level (AL)

The cash assets level in this study is calculated as follows (Christian and Stephan, 2012):

$$\text{Total assets' book value} / (\text{MS} + \text{cash}) = \text{Cash Assets level} \quad (1)$$

MS: short-term bank deposits (which do not have the nature of the cash)

- Investment - Cash Flows Sensitivity (ICFS)

Arsalan et al (2006) model has been applied in this study to calculate the Investment - Cash Flows Sensitivity:

$$\text{INV}_{i,t} = \beta_0 + \beta_1 \text{CFLOW}_{i,t} + \beta_2 \text{Q}_{i,t} + \epsilon_{it} \quad (2)$$

$\text{INV}_{i,t}$  : which represents the (i) company investment in year (t), which is calculated by the ratio of the capital expenditure (changes in fixed assets of the current year compare with last year) to the net fixed assets at the beginning of the period.

$\text{CFLOW}_{i,t}$  : which represents the cash flow of the (i) company in year (t), which is calculated by the ratio of the cash flow obtained from the operating activities to the net fixed assets at the beginning of the period.

$\text{Q}_{i,t}$  : which is the growth opportunities of (i) company in year (t) which is calculated by the total debts book value plus market value of shareholders' equity divided by the book value of the total assets.

(i) Is the company (space dimension) and (t) is the year (time dimension)  
The coefficient of  $\text{CFLOW}_{i,t}$  is the investment – cash flow sensitivity index in this model.

- Financing cost (COD)

The debt cost is considered as the financing cost in this study. The debt cost is calculated by the ratio of the amount of paid interest cost

divided by the amount of the paid instalment during the year. Since the cost derived from the interest cost can create a tax shield for the company which is part of the acceptable costs for the national tax administration. So this tax shield will be subtracted from the mentioned cost, thus after calculating the debt costs, the mentioned costs should be multiplied on (100-22.5) percent in order to put aside the tax shield.

#### **4.4. Control Variables**

According to Huwang et al (2010) model, the following variables have been considered as control variables:

$BM_{i,t}$  : the ration of the book value to market value shareholders' equity (control index of the company's growth opportunity)

$SIZE_{i,t}$  : natural logarithm of the company's assets

$LEV_{i,t}$  : the ratio of the company's debts to the company's assets (control index of the financial leverage)

$PPE_{i,t}$ : gross assets, machinery and equipment homogenized with assets of the company (control index of the tangible assets).

Ownership structure (OS):

Large shareholders' efficient monitoring can reduce the excessive power of managements and the information imbalance resulting in investment- cash flows sensitivity. In order to calculate the ownership structure in this study, the ownership of the blocked stock percentage has been used following the previous studies; the owners with at least 5 percent of the company's share are considered the ownership of the blocked stock percentage.

## **5. FINDINGS**

### **5.1 Descriptive statistics and the normality of variables**

The statistical descriptions of the study variables including the central indicators, distribution and other indicators are as follows:

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Table 2: Statistical description of the research data

variable	abbreviation	Number of evidences	mean	median	Standard Deviation	Skewness	Kurtosis
<b>Investment – cash flows sensitivity</b>	ICFS	710	0.197	0.314	0.882	-0.114	3.226
<b>Financing costs</b>	COD	710	0.104	0.106	0.050	0.360	3.749
<b>Cash Assets</b>	AL	710	0.055	0.037	0.063	3.424	18.427
<b>Firm size</b>	SIZE	710	13.541	13.463	1.551	0.335	3.237
<b>Ownership structure</b>	OS	710	0.721	0.760	0.190	-1.493	5.768
<b>Ratio of the book value to market value</b>	BM	710	0.767	0.608	0.623	2.694	12.491
<b>Financial leverage</b>	LEV	710	0.811	0.681	0.547	3.098	9.471
<b>Gross assets, machinery and equipment</b>	PPE	710	0.306	0.285	0.274	1.486	4.127

The Kolmogorov-Smirnov test has been applied in order to investigate the normality of the variables and residuals. If the test probability is more than 0.05, the normality of the variables can be confirmed with 95% confidence and vice versa. Table 3 shows the normal distribution of the dependent variable of the study.

Table 3: K-S test for normality of the data

Statistical Test	ICFS	COD	AL	SIZE	OS	BM	LEV	PPE
<b>Z score</b>	1.244	1.365	4.097	2.581	1.328	1.524	1.263	3.076
<b>Asymp (sig)</b>	0.091	0.088	0.000	0.000	0.092	0.073	0.112	0.000

Pearson Correlation Matrix is a test for specifying the amount of the data correlation. As it is represented in table 4, there is a positive and significant relationship between the firm's size and the investment – cash flows sensitivity in the confidence level of 99%, this relationship is obtained by the correlation coefficient of 0.297 using Pearson correlation test which shows the positive relationship between firm size and the investment- cash flow sensitivity at the rate of 29.7%. There is a negative and significant relationship between the cash assets and financing cost in the confidence level of 99%, this relationship is obtained by the correlation coefficient of 0.130 using Pearson correlation test which shows the negative relationship between cash assets and the financing costs at the rate of 13%. There is a positive and significant relationship between the firm's size and the financing cost in the confidence level of 95%, this relationship is obtained by the correlation coefficient of 0.082 using Pearson correlation test which shows the positive relationship between cash assets and the financing costs at the rate of 8.2%. .There is a significant relationship between two variables in other cases with the probability less than 5%, however their correlation coefficients are not in a strong level and cause no breakdown in our regression analysis.

Table 4: Pearson Correlation Matrix

Sig.	ICFS	COD	AL	SIZE	OS	BM	LEV	PPE
<b>ICFS</b>	1							
<b>COD</b>	-0.001	1						
<b>AL</b>	-0.017	-0.130**	1					
<b>SIZE</b>	0.297**	0.082*	0.059	1				
<b>OS</b>	-0.026	-0.076	0.042	-0.004	1			
<b>BM</b>	-0.146*	0.049	-0.018	0.114*	-0.081	1		
<b>LEV</b>	-0.037	0.153*	*	**	0.023	-0.091	1	
<b>PPE</b>	0.074	0.237**	0.143	0.213	-0.005	-0.022	0.309**	1

*\*and\*\* are confidence levels of 0.05 and 0.01 respectively.*

## 5.2. Results of the testing hypothesis

Results of hypothesis test are as follows:

**Hypothesis one:** There is a significant relationship between the cash assets and the investment –cash flow sensitivity.

$$ICFS_{i,t} = \beta_0 + \beta_1 AL_{i,t} + \beta_2 SIZE_{it} + \beta_3 OS_{it} + \beta_4 BM_{it} + \beta_5 LEV_{it} + \beta_6 PPE_{it} + \epsilon_{it} \quad (3)$$

Table 5: Results of testing hypothesis one

Variable	abbreviation	Coefficient	t-statistics	Prob.
Constant value	C	-1.999	-5.024	0.000
Cash assets	AL	-0.481	-0.738	0.460
Firm size	SIZE	0.170	6.344	0.000
Ownership Structure	OS	-0.109	-0.501	0.615
Ratio of the book value to Market Value	BM	-0.425	-1.659	0.159
Financial leverage	LEV	-0.034	-2.671	0.024
Net tangible assets	PPE	0.117	2.436	0.012
R Square	F	13.567	Prob.0.000	
Adjusted R Square	Godfrey	2.750	Prob.0.100	0.100
Square	F-white	1.339	Prob. 0.214	0.093
Durbin-Watson	F-limer	0.561	Prob.0.690	1.753

According to the figures represented in table 5, the confidence level of F-limer score (0.690) is more than the acceptable error (5 percent), so the pooled data method (consolidated) is preferred over the panel data method (the Panel). Moreover, the significance level of the F-white score is (0.214), so the regression does not have any heteroscedastic; besides, as the confidence level of Godfrey score is 0/100, the regression has no serial correlation problem. Finally, the F score is equal to 0/000 with confidence level below 5 percent; thus there is no significant relationship between cash assets and investment-cash flow sensitivity. Additionally, because the Durbin-Watson test score is between 1.5 and 2.5, we can conclude that there is no correlation problem among variables. The coefficient of determination also shows that the changes in independent and control variables are representative of 10 percent change in dependent variable. Results of testing hypotheses two are as follow:

Hypothesis two: There is a significant relationship between cash assets and financing costs.

$$COD_{i,t} = \beta_0 + \beta_1 AL_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 OS_{i,t} + \beta_4 BM_{i,t} + \beta_5 LEV_{i,t} + \beta_6 PPE_{i,t} + \epsilon_{i,t} \quad (4)$$

Table 6: Results of testing hypotheses two

Variable	abbreviation	Coefficient	t-statistics	Prob.
Constant value	C	0.084	3.556	0.000
Cash assets	AL	-0.105	-2.732	0.006
Firm size	SIZE	0.002	1.846	0.045
Ownership Structure	OS	-0.018	-1.437	0.151
Ratio of the book value to Market Value	BM	0.067	2.920	0.003
Financial leverage	LEV	0.563	0.791	0.281
Net tangible assets	PPE	0.036	2.026	0.011
R Square	0.080	F	9.251	Prob. 0.005
Adjusted R Square	0.077	Godfrey	2.711	Prob. 0.127
Durbin-Watson	1.758	F-white	1.824	Prob. 0.062
		F-limer	2.098	Prob. 0.080

According to the figures represented in table 6, the confidence level of F-limer score (0.080) is more than the acceptable error (5 percent), so the pooled data method (consolidated) is preferred over the panel data method (the Panel). Moreover, the significance level of the F-white score is 0.062, so the regression does not have any heteroscedastic; besides, as the confidence level of Godfrey score is 0/127, the regression has no serial correlation problem. Finally, the F score is equal to 0/000 with confidence level below 5 percent, so the regression is explanatory; but since the confidence level of cash assets (independent variable) is less than 5 percent, there is negative and significant relationship between cash assets and financing cost; that is for every unit of increase in cash assets, there is 10.5 percent decrease in financing costs. The Durbin-Watson test score is also between 1.5 and 2.5, which shows that there is no correlation problem among variables. The coefficient of determination also shows that the changes in

independent and control variables are representative of 8 percent change in dependent variable.

## 6. CONCLUSION

Respecting the theoretical foundations the result of the present study show that regarding the first hypothesis, there is no significant relationship between the cash assets and investment cash flows sensitivity. Regarding the second hypothesis there is negatively significant relationship between financing costs and cash assets. The first hypothesis is rejected; according to Johnson (1986) managers may take advantage of the cash flows and use them in projects with negative net present value (NPV) leading to inefficient investment. Accordingly, owners are notifying this approach among managers and restricting these cash resources. Thus cash assets increase and decrease do not lead to investment cash flow sensitivity because due to the above mentioned descriptions, the economic unit's cash resources for investment are supplied from another source, which implies the influence of other factors on investment cash flow sensitivity. The second hypothesis confirms costs of debt resulting from borrowing as one of the decisive factors in determining the creditor's information risk and the risk of non-payment obligations has a major role in creditors and investors decision making. Thus it is the main criteria for decision making about the validation of economic units. However, regarding the result of the second hypothesis, we can say that one of the effective factors on debt costs is changes in cash assets because banks and financial institutes (creditors) have some assumptions for allocating credits to economic units. One of these assumptions is the amount of cash assets; so in case of any financial crisis in these economic units, the creditors are able to reclaim their provided facilities. Thus creditors demand less financing cost from the economic units with more cash assets.

### *Further Suggestions*

- Regarding the results of this study, investors should have special consideration about the variables such as cash asset of the economic units when analyzing for purchasing the companies' shares. Because this variable leads to a significant reduction in financing costs.
- Given that the management's aim is to attract companies' owners trust, they need to know that increase in cash assets of economic units cause decrease in financing cost that is reduction of the agency's problems. However, it should be considered that the cash assets do not block in the economic unit more than the acceptable level.
- Due to the negative relationship between the cash assets and financing costs, it is recommended that Stock Exchange pursue a set of regulations based on which the companies should have adequate cash assets.

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