Investigating the Effect of Financial Constraints and Different Levels of Agency Cost on Investment Efficiency

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ABSTRACT

This research attempts to investigate the effect of financial constraints and different levels of agency costs on the investment efficiency of companies in Iran. Following the design of the financial risk assessment indexes, the transaction information was collected from the Stock Exchange in the five-year period of 2011-2015. The statistical sample consists of 128 companies selected by sampling method based on Cochran formula in which totally obtained 640 year-firm data. Linear regression and correlation were used to investigate the hypotheses of the research. Also Eviews software was used to analyse the data and test the hypotheses. What is summarized in the overall conclusion of the research hypothesis test is that financial constraints are effective on investment performance based on the indicators (kz) and (ww), as well as the various levels of agency costs, including high and low agency costs effect on investment efficiency.

1 Introduction

The development of investment is one of the ways to solve economic problems. Due to resources constraints, the importance of investment efficiency is emphasized. Particularly in a country like Iran under the current circumstances and despite sanctions, the importance of this issue becomes clearer. Two factors affecting the use of investment opportunities are the existence of sufficient cash and management decisions, both of which can be risked by the imperial objectives of management; hence, controlling the management can reduce inefficiencies in investment. The problems of information asymmetry between management and financial institutions and the challenge of agency between main shareholders and minority investors, as well as between management and shareholders, have significantly influenced the decision making of enterprise investment. These problems are more severe in emerging markets. Given the existing defects in the capital market and the weak mechanisms of corporate governance, the motivation to conduct research in line with corporate investment decisions has

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been created in many countries, with financial constraints and agency costs [4].

By studying literature in this regard, it can be seen that there is a positive relationship between financial development and economic growth. Given the weak regulations and the fact that a significant number of state-owned companies are market shares, they are not very effective, and stock prices are not real values. Therefore, financial markets do not play an effective role in allocating resources and eliminating financial constraints. At the same time, due to the weak legal system and weak corporate governance mechanisms, the agency problems are huge and have led to over-investment in some of the companies. For example, governmental bureaucrats may have an impact on over-investment in order to achieve political ends. These effects will also be more in the presence of soft budget and widespread corruption. Over-investment may be more than capacity and cause inefficiencies which in turn can disrupt sustainable development and prosperity in countries. In this research, firstly, over and under-investment will be investigated at the same time. Then, unlike many previous studies that investigated the sensitivity of investment to cash flow, this study investigated the sensitivity of abnormal investment toward free cash flow. With the deduction of the required and expected investment from the cost capital and the elimination of compulsory cash flow components, this approach will prevent the free flow of cash from future investment opportunities. As a result, in the absence of financial constraints and agency costs, over and under-investment should represent a systematic response to free cash flow. As a result, this study examines the effect of financial constraints and the different levels of agency costs on the investment performance of listed companies in Tehran Stock Exchange. Therefore, the main questions in this study will be as follows:

✓ Are financial constraints effective on investment efficiency?

✓ Are the agency cost effective on the efficiency of the investment?

2 Theoretical Literature, Background and Research Hypotheses

Companies' growth and development and the separation of ownership from management have today made agency issues to a major concern for investors. Conflicts between managers and owners as well as information asymmetry between the two groups can be two of the key factors in creating agency issues. Based on the concept of information asymmetry, managers have more information than outsourced investors on cash flows, investment opportunities, and in general, future prospects and company value. Information asymmetry can affect the cost of financing and project selection. For example, information asymmetry between firms and investors (often called incompatible selection problem) is an important stimulus to increase financing costs for companies seeking to finance their investment opportunities. Most studies conducted in the area of separation of ownership from management have been based on the agency theory and this theory has been dominant theory [10]. According to Jensen and Meckling [6] the agency relationship is the contract according to which one or more owner (shareholders) nominates another person as agent (manager) on him/her behalf and authorizes him/her to make a decision. The formation of the agency relationship causes the owner delegate a degree of authority and decision power to the agent to use this authority to maximize the owner's wealth. However, due to differences in the owner-agent utility function, each of them seeks to maximize their utility. Therefore, managers probably have the motivation and ability to work towards raising their own personal interests. Consequently, the actions and decisions of managers do not necessarily lead to maximizing the wealth and welfare of the owners. In addition, Dey et al [3] stated that

it is assumed that there is asymmetric information between the owner and the agent. Therefore, the agency relationship is accompanied by conflicting interests that result from different goals and information asymmetries between the owner and the agent, and the combination of these two features probably hinders the growth of the wealth of the owners.

Conceptually, the investment efficiency is achieved (only) when the company invests in all projects with a current net positive value. Of course, this will work if the market is complete and there are none of the incomplete market issues, including false choices and agency costs [2], [12], Yang and Jiang [14] argued that over-investing has devastating consequences at company level and in the economy of a country. The issue of over-investing would reduce the company's investment efficiency and inflames the economy and heavily harms the interests of shareholders and leads to the apparent development of macroeconomics, which is one of the major issues in major corporations, According to Roka et al. [11], over-investing can be classified into two issues of over-investment of management and over-investment in risky plans (incentives for risk transfer).These two issues can occur when resource management policies are considered with regard to the optimal level of investment. The issue of over-investing of management is based on the hypothesis that managers emphasize the importance of their role. The reason for this is the conflict of interest that leads to the manager's opportunistic behaviour and therefore overall company's value reduction. In fact, managers see their goal beyond the goal of maximizing the value of the stock and the company.

On the other hand, some researchers, such as Myers [8], have shown that debt relationships can encourage executives to opt out of investing in schemes with a positive net present value, and thus reduce the value of the company. He believes that the existence of a high-risk debt, which has a lower market value than nominal value, has a negative impact on corporate investment choices. In his view, the company's value is comprised of assets and growth opportunities that are based on profitable investments. The value of growth opportunities depends on the decision-making of management for investment. Growth opportunities are influenced by the way of financing the assets used and the capital structure of the company. Hence, the key to creating under-investment problem is the quality of company decision making. Given the theoretical foundations and the researches presented in this regard, the following hypotheses are developed:

First main hypothesis: Financial constraints affect the efficiency of investment.

First sub-hypothesis: Financial constraints based on index (kz) affect the efficiency of investment.

Second sub-hypothesis: Financial constraints based on index (WW) affect the efficiency of investment.

In general, two theories are discussed in cash, exchange theory, and hierarchical theory. According to Wang [13] the first theory, firms determine the optimal level of cash holding based on balances between benefits and cash holding costs. The three main motivations for cash holding can be seen as the incentive for trading, prudential and speculation. Kashanipour and Naghinejad [8] stated that in the second theory due to information asymmetry and signalling problems associated with external financing, a hierarchical financing procedure is followed, in which domestic resources are preferred to foreign sources and if more funds are needed for current positive value, the debt is settled and it will accumulate cash assets. Generally, in accounting studies, the sensitivity of cash flows is divided into two categories, one of which is the sensitivity of cash flow investments which refers to the percentage

of changes in corporate capital expenditures in relation to changes in cash flows, and the other in the statement is sensitivity of cash flows which refers to the percentage change in cash holdings in relation to changes in cash flows. The study showed that institutional investors increase investor enthusiasm for interfering with ongoing corporate supervision, in addition to analysing firms, and thus reducing investment and exchange costs. Given the free cash flow theory posed by Jensen [7], more internal cash flow allows managers to avoid market control.

In this case, they do not need shareholders' consent and are free to decide on investments in their discretion. Managers who are not willing to pay cash (such as dividends) are motivated to invest, even when there is no investment with a net present value of the positive. In companies with poor shareholder's protection, managers can accumulate cash with relative immunity and divide less cash profits.

According to Arsalan et al. [1], in the corporate governance literature, there are two approaches to institutional investors: effective oversight hypothesis and convergence hypothesis of interests. Effective oversight hypothesis states that with more investment of institutional investors, more effective oversight is applied and many deal problems will be resolved. While the convergence hypothesis of interests states that the interests of the major institutional investors are in line with the interests of management and this can encourage managers to make non-optimal decisions; according to theoretical foundations and researches presented in this regard, the following hypotheses are formulated:

Second main hypothesis: Agency costs are effective on investment efficiency.

First sub-hypothesis: High agency costs are effective on investment efficiency.

Second sub-hypothesis: Low agency costs are effective on investment efficiency.

3 Research Methodology

The statistical population is all listed companies in the Tehran Stock Exchange in the period from 2011 to 2015. Sample selection steps are presented in Table 1:

Table 1: Different sampling steps

Apply Limitations	Numbers
Number of Companies Acquired in Tehran Stock Exchange at the end of 2015	538
The number of companies that have gone out of stock in this period	(93)
The number of companies entered in the stock in this period	(57)
The number of companies that have changed their fiscal year	(42)
The number of companies whose financial information was not available at the time of the research	(17)
The number of companies that have been intervals in business for more than 3 months at the time of the research	(102)
The number of companies whose financial year does not end at 29/12	(36)
Number of companies in the statistical society	(191)

To determine the sample size in this study, we used the Cochran formula, which is described below:

$$n = \frac{N \times z^2 \; ^\alpha/_2 \times \delta^2}{(N-1)\varepsilon^2 + z^2 \; ^\alpha/_2 \times \delta^2}$$

n = Statistical sample,

N = Statistical population,

Z = the value of the normal variable corresponds to the confidence level for the 95% confidence interval which is equal to 1.96,

σ = society variance equal to (0.5),

ε = Allowed error equal to (0.05) that the statistical sample obtained by the Cochran formula is 128.

4   Models and Research Variables

The regression model of the first main hypothesis:

$$IE_{i,t} = \alpha + \beta_1(KZ_{i,t}) + \beta_2(cash_{i,t}) + \beta_3(RoA_{i,t}) + \beta_4(Size_{i,t}) + \beta_5(Q_{i,t}) + \beta_6(Lev_{i,t}) + \beta_7(Age_{i,t}) + V_{i,t}$$

The regression model of the second sub-hypothesis of first main hypothesis

$$IE_{i,t} = \alpha + \beta_1(WW_{i,t}) + \beta_2(cash_{i,t}) + \beta_3(RoA_{i,t}) + \beta_4(Size_{i,t}) + \beta_5(Q_{i,t}) + \beta_6(Lev_{i,t}) + \beta_7(Age_{i,t}) + V_{i,t}$$

The regression model of the first sub-hypothesis of second main hypothesis

$$IE_{i,t} = \alpha + \beta_1(HAC_{i,t}) + \beta_2(Cash_{i,t}) + \beta_3(ROA_{i,t}) + \beta_4(Size_{i,t}) + \beta_5(Q_{i,t}) + \beta_6(Lev_{i,t}) + \beta_7(Age_{i,t}) + V_{i,t}$$

The regression model of the second sub-hypothesis of second main hypothesis

$$IE_{i,t} = \alpha + \beta_1(LAC_{i,t}) + \beta_2(Cash_{i,t}) + \beta_3(ROA_{i,t}) + \beta_4(Size_{i,t}) + \beta_5(Q_{i,t}) + \beta_6(Lev_{i,t}) + \beta_7(Age_{i,t}) + V_{i,t}$$

Where:

Ie$_{i,t}$= investment efficiency,

AC$_{i,t}$= agency cost,

HAC$_{i,t}$= high agency cost,

LAC$_{i,t}$= low agency cost,

kz$_{i,t}$= index (kz) for financial constraint,

ww$_{i,t}$= index (ww) for financial constraints,

Sizei,t= Company size,

Agei,t= Company age,

RoAi,t= Return on assets,

Leveragei,t= Financial Leverage,

Qi,t = Q-Tobin ratio,

Cashi,t= Cash.

The dependent variables:

IE: Investment efficiency

To measure the dependent variable of the research i.e, the efficiency of the investment, the following model has been used.

The total investment (I_total) is divided into two parts:

1. New investment expenditures (I_new)

2. Expenditures on investment to maintain assets (I_mein)

$$I_{\_new_{i,t}} = a_0 + a_1 I_{\_new_{i,t-1}} + a_2 Cash_{i,t-1} + a_3 Q_{i,t-1} + a_4 Size_{i,t-1} + a_5 Age_{i,t} + a_6 ROA_{i,t-1} \quad (1)$$
$$+ a_7 Leverage_{i,t-1} + v_i$$

Cashi,t= the ratio of total cash flows and short-term investment to total assets

Q = the ratio of the total market value of the equity and the book value of the debt to the book value of the assets

Sizei,t= natural logarithm of the total assets

Agei,t = number of years of company age

RoAi,t = ratio of net earning to total assets

Leveragei,t= the ratio of total debt to total assets

I_totali,t= capital expenditures - receipts from the sale of property, machinery and equipment

I_main.i,t = depreciation of intangible assets + depreciation of tangible assets

$$I\_mein_{i,t} - I\_total_{i,t} = I\_new_{i,t} \quad (2)$$

If the residuals of above model be greater than zero considered as over-investment and if be smaller than zero it considered as under-investment. Obviously, "the size symmetry of these values can be an indicator for measuring the efficiency of an investment (IE)." Therefore, the larger (smaller) the size symmetry of the errors, the greater (less) the efficiency of the investment.

Independent variable:

The model used by Yang and Jiang [14] have been used to measure the agency costs.

$$AC_{i,t} = a_0 + a_1 AC_{i,t-1} + a_2 Cash_{i,t-1} + a_3 Q_{i,t-1} + a_4 Size_{i,t-1} + a_5 Age_{i,t} + a_6 ROA_{i,t-1} \qquad (3)$$
$$+ a_7 Leverage_{i,t-1} + v_i$$

$Cash_{i,t}$= the ratio of total cash and short-term investments to total assets

Lev = the ratio of debt to assets

Q = the ratio of total market value of equity and book value of debt to the book value of assets

$RoA_{i,t}$= the ratio of net earning to total assets

AC = ratio of administrative and general expenses and sales to total assets

$Size_{i,t}$= natural logarithm of total assets

Age = number of years of the listing

Vi are the same residuals that if they are larger than zero, they are considered to be high-costs companies, and if be smaller than zero, considered as low-cost companies. Finally, we used the numbers zero and one to quantize the variables.

Financial constraints: The most complete and straightforward definition of financial constraints is that companies are at financing constraint when they are faced with a gap between internal consumption and external costs of allocated funds.

To investigate the role of financial constraints on corporate investment behaviour, two methods have been used to measure financial constraints: index (kz) and index (ww)

To distinguish the limited companies to finance from other business units in order to test one of the hypothesis, we used the Kaplan & Zinglas financing constraint Indicator customized by Tehrani and Hesar Zadeh in the following model.

$$KZ_{IR} = 17.330 - 37.486C - 15.216Div + 3.394Lev - 1.402MTB \qquad (4)$$

C: the ratio of cash to assets

Div: Dividend earning to assets

$Lev_{i,t}$: ratio of debt to assets

$MTB_{i,t}$= The ratio of the total market value of equity and the book value of debt to the book value of assets

The method of using this index is to first enter real values in the KZ index equation and then the amount of KZ is calculated. The values are arranged from smallest to largest, and then divided into five sections, which can identify companies in the fourth and fifth quintiles as financing constraints. Finally, we used the numbers zero and one to quantize the variable.

The ww index, introduced by White and Woo to measure the funding limitations that Ibrahim Kordeler et al. customized it in the following model, is used further in this study along with the Kaplan and Zinglas Financial Constraint Index.

$$WW_{IR} = 80.04 - 5.182CFO - 0.106Div + 5.112Lev - 0.662LogTA \qquad (5)$$

Divi,t = Dividend earning to assets

Lev: the ratio of debt to assets

CFOi,t= operating cash flow divided by the sum of assets at the end of the period

LogTAi,t= natural logarithm of total assets

The method of using this index is to first enter the actual values in the Wo index equation and then the WW value is calculated. The values are arranged from smallest to largest, and then divided into five sections, which can identify firms in the fourth and fifth quintiles as financing constraints. Finally, we use the numbers zero and one to quantize the variable.

Control variables:

Sizei,t= Natural logarithm of total assets (size of company)

Agei,t= Number of years of company ages (company age)

RoAi,t = Ratio of net earning to total assets (return on assets)

Leveragei,t = Ratio of total debt to total assets (financial leverage)

Qi,t = The ratio of total market value of equity and book value of debt to the book value of assets (Q-Tubin ratio)

Cashi,t = The ratio of total cash and short-term investment to total assets (cash)

5 Research Findings
5.1 Descriptive statistics

The descriptive findings in relation to the research variables are shown in tables 2 and 3.

Table 2: Indicators describing the variables of research

	Investment efficiency	Indicator (kz) for financial constraints	In cash	Return on assets	Company size	Q-Tubin Ratio
Average	-0.065047	12.60942	0.051094	0.086578	14.57231	1.733422
Median	-0.040000	13.80000	0.030000	0.080000	14.28000	1.390000
Maximum	0.000000	27.83000	0.480000	0.630000	18.74000	7.670000
Minimum	-0.550000	-13.61000	0.000000	-2.440000	10.35000	0.570000
Standard Deviation	0.066240	6.592630	0.067444	0.179997	1.659659	0.953882
Skewness	-2.595509	-0.944537	2.767627	-3.912360	0.286772	2.370424
Kurtosis	13.85910	3.948909	12.31541	62.84797	2.264952	10.56078
Average	0.213555	0.235645	0.978556	0.312555	0.115458	0.385456
Median	0.795246	0.788546	0.545545	0.765546	0.895550	0.425486

Table 2: Continue

	Q-Tubin Ratio	Company size	Return on assets	In cash	Indicator (kz) for financial constraints	Investment efficiency
Maximum	1109.390	9326.280	55.41000	32.70000	8070.030	-41.63000
Minimum	581.4206	1760.104	20.70301	2.906634	27772.71	2.803799
Standard Deviation	640	640	640	640	640	640
Skewness	128	128	128	128	128	128

Table 3: Indicators describing the variables of research

	Financial Leverage	Company age	Indicator (ww) for financial constraints	Agency cost	High Agency cost	Low Agency cost
Average	0.644750	3.648375	73.16555	-0.003344	0.309375	0.690625
Median	0.660000	3.780000	73.27000	-0.010000	0.000000	1.000000
Maximum	2.000000	4.160000	80.49000	0.590000	1.000000	1.000000
Minimum	0.010000	2.400000	67.73000	-0.080000	0.000000	0.000000
Standard Deviation	0.224121	0.379662	1.597284	0.031321	0.462598	0.462598
Skewness	0.187318	-1.030195	-0.273773	11.04019	0.824795	-0.824795
Kurtosis	5.432647	3.168899	4.657921	204.1282	1.680287	1.680287
Jack-Bera	0.165455	0.114556	0.815545	0.109555	0.114550	0.145866
Probability	0.845656	0.892596	0.195546	0.945255	0.845485	0.845455
Total	412.6400	2334.960	46825.95	-2.140000	198.0000	442.0000
Total of Standard Deviation	32.09716	92.10771	1630.291	0.626844	136.7437	136.7437
Observation	640	640	640	640	640	640
Sections	128	128	128	128	128	128

Considering that the significance level of the F-limer and Hausman tests obtained from Table 4 is less than 5%, it is shown that the data are panel and the effects are constant.

5.2 F-Limer and Hausman Test

Table 4: F-Limer and Hausman test

F-Limer test				
Research hypotheses			Significant level	Result
First sub-hypothesis	F-statics	3.458817	0.0000	Panel data
Second sub-hypothesis	F-statics	3.411915	0.0000	Panel data
Second main hypothesis	F-statics	2.647292	0.0000	Panel data
First sub-hypothesis	F-statics	3.135956	0.0000	Panel data
Second sub-hypothesis	F-statics	3.135956		Panel data
Hausman test				
First sub-hypothesis	K2-statics	0.0014	23.519022	Constant effects
Second sub-hypothesis	K2-statics	0.0024	22.104635	Constant effects
Second main hypothesis	K2-statics	0.0002	28.225386	Constant effects
First sub-hypothesis	K2-statics	0.0009	24.604150	Constant effects
Second sub-hypothesis	K2-statics	0.0009	24.604150	Constant effects

5.3 Summary of analyses by separation of each hypothesis

5.4.1 Testing the first main hypothesis

Financial constraints affect the investment efficiency. To answer this hypothesis, the following sub-assumptions are tested. Financial constraints based on index (kz) affect the investment performance.

$$IE_{i,t} = \alpha + \beta_1(KZ_{i,t}) + \beta_2(cash_{i,t}) + \beta_3(RoA_{i,t}) + \beta_4(Size_{i,t}) + \beta_5(Q_{i,t}) + \beta_6(Lev_{i,t}) + \beta_7(Age_{i,t}) + V_{i,t}$$

$H_0: \beta_1 = 0$

$H_1: \beta_1 \neq 0$

The results of the estimation showed that the probability of t-statistic for the constant coefficient and the coefficients of the index variable (kz) for the financial constraint (0.000) is less than 5%; there-

fore, the above relation is statistically significant.

Table 5: Estimating the model coefficients of the first sub-hypothesis

Variables	Coefficient	Standard deviation	t-statics	Probability
y-Interception	0.260125	0.019339	13.45070	0.0000
Index (kz) for financial constraint	-0.001793	0.000333	-5.378685	0.0000
Cash	0.041782	0.002307	18.11002	0.0000
Return on assets	0.019091	0.001470	12.98755	0.0000
Company size	-0.013267	0.001226	-10.81847	0.0000
Q-Tubin	0.005941	0.001993	2.981810	0.0030
Financial leverage	-0.016632	0.012852	-1.294158	0.1962
Company age	-0.025218	0.004978	-5.065840	0.0000
Deterministic coefficient		0.86	Durbin-Watson	38.2
Adjusted Deterministic coefficient		0.85	F-probability level	00.0
$IE_{i,t} = 0.260125 - 0.001793(KZ_{i,t}) + 0.041782(cash_{i,t}) + 0.019091(RoA_{i,t}) - 0.013267(Size_{i,t}) + 0.005941(Q_{i,t}) - 0.016632(Lev_{i,t}) - 0.025218(Age_{i,t}) + V_{i,t}$				

And the coefficient estimated by the software for the index variable (kz) for the financial constraint is equal to 0.0017 and therefore, with 95% confidence, this variable is significant in the regression model. The adjusted determination coefficient shows the explanatory power of independent variables, which explains the extent to 85% of the variations of the dependent variable. As well as considering that the level of the F-statics probability level is less than 5%, the whole model is statistically significant. Therefore, the assumption H0 is rejected, that is, the financial constraints based on the index (kz) affect the investment performance.

Financial constraints based on the (ww) indicator affect investment efficiency.

$$IE_{i,t} = \alpha + \beta_1(WW_{i,t}) + \beta_2(cash_{i,t}) + \beta_3(RoA_{i,t}) + \beta_4(Size_{i,t}) + \beta_5(Q_{i,t}) + \beta_6(Lev_{i,t}) + \beta_7(Age_{i,t}) + V_{i,t}$$

$H_0: \beta_1 = 0$

$H_1: \beta_1 \neq 0$

The results of the estimation show that the probability of the t-statistic for the constant coefficient and the coefficients of the variable of financial constraints is less than 5% based on the index (ww)

(0.000); therefore, the relationship is statistically significant.

Table 6: Estimating the model coefficients of the second sub-hypothesis

Variables	Coefficient	Standard deviation	t-statics	Probability
y-Interception	1.298202	0.202706	6.404360	0.0000
Index (kz) for financial constraint	-0.013321	0.002582	-5.160322	0.0000
Cash	0.046094	0.023015	2.002743	0.0457
Return on assets	0.022609	0.001477	15.30795	0.0000
Company size	-0.022133	0.002015	-10.98517	0.0000
Q-Tubin	-0.003453	0.001848	-1.868620	0.0623
Financial leverage	0.042382	0.019090	2.220123	0.0269
Company age	-0.025136	0.004904	-5.125626	0.0000
Deterministic coefficient		0.76	Durbin-Watson	38.2
Adjusted Deterministic coefficient		0.68	F-probability level	00.0
$IE_{i,t} = 1.298202 - 0.013321(WW_{i,t}) + 0.046094(cash_{i,t}) + 0.022609(RoA_{i,t}) + -0.022133 (Size_{i,t}) - 0.003453(Q_{i,t}) + 0.042382(Lev_{i,t}) + -0.025136(Age_{i,t}) + V_{i,t}$				

And the coefficient estimated by the software for the variable of financial constraints based on the index (ww) is 0.0133 and is statistically significant, so with 95% confidence this variable is significant in the regression model. The adjusted determination coefficient shows the explanatory power of independent variables, which explains 68% of the variations of the dependent variable. As well as considering that the level of the F-item is less than 5%, the whole model is statistically significant. Therefore, the assumption H0 is rejected, that is, financial constraints based on the index (ww) affect the investment efficiency.

5.4.2 Second main hypothesis test

Agency costs are effective on investment efficiency. In order to answer this hypothesis, sub-assumptions are tested. Agency costs are highly effective on investment efficiency.

$$IE_{i,t} = \alpha + \beta_1(HAC_{i,t}) + \beta_2(Cash_{i,t}) + \beta_3(ROA_{i,t}) + \beta_4(Size_{i,t}) + \beta_5(Q_{i,t}) + \beta_6(Lev_{i,t}) + \beta_7(Age_{i,t}) + V_{i,t}$$

$H_0: \beta_1=0$

$H_1: \beta_1 \neq 0$

The results of the estimation show that the probability of t-statics for constant coefficient and variable coefficients of high agency costs (0.000) is less than 5%; therefore, the above relationship is statistically significant and the coefficient estimated by the software for the variable agency costs is -1.0888 and significant, so with 95% confidence, this variable is significant in the regression model.

Table 7: Estimating the model coefficients of the first sub assumption from second main-hypothesis

Variables	Coefficient	Standard deviation	t-statics	Probability
y-Interception	0.201700	0.018745	10.76007	0.0000
Index (kz) for financial constraint	-0.018892	0.002391	-7.902193	0.0000
Cash	0.058139	0.019507	2.980452	0.0030
Return on assets	0.039835	0.014226	2.800140	0.0053
Company size	-0.012240	0.001128	-10.85282	0.0000
Q-Tubin	-1.49E-05	0.001663	-0.008950	0.9929
Financial leverage	-0.025954	0.011929	-2.175602	0.0300
Company age	-0.022994	0.004578	-5.023112	0.0000
Deterministic coefficient		0.706	Durbin-Watson	38.2
Adjusted Deterministic coefficient		0.695	F-probability level	00.0
$IE_{i,t} = 0.201700 - 0.018892(HAC_{i,t}) + 0.058139(Cash_{i,t}) + 0.039835(ROA_{i,t}) - 0.012240(Size_{i,t}) - 1.49E - 05(Q_{i,t}) - 0.025954(Lev_{i,t}) - 0.022994(Age_{i,t}) + V_{i,t}$				

The adjusted determination coefficient shows the explanatory power of the independent variables, which can explain 69% of the variations of the dependent variable. As well as considering that the level of the F-item is less than 5%, the whole model is statistically significant. Therefore, the assumption H0 is rejected, that is, the high agency costs are effective on the efficiency of the investment.

Low agency costs are effective on investment efficiency.

$$IE_{i,t} = \alpha + \beta_1(LAC_{i,t}) + \beta_2(Cash_{i,t}) + \beta_3(ROA_{i,t}) + \beta_4(Size_{i,t}) + \beta_5(Q_{i,t}) + \beta_6(Lev_{i,t}) + \beta_7(Age_{i,t}) + V_{i,t}$$

$H_0: \beta_1 = 0$

$H_1: \beta_1 \neq 0$

The results of the estimation show that the probability of the t-statistic for the constant coefficient and the coefficients of the variable of low agency costs (0.000) is less than 5%; therefore, the above rela-

tionship is statistically significant.

Table 8: Estimating the model coefficients of the second sub hypothesis from second main hypothesis

Variables	Coefficient	Standard deviation	t-statics	Probability
y-Interception	0.220591	0.018116	12.17633	0.0000
Index (kz) for financial constraint	-0.018892	0.002391	-7.902193	0.0000
Cash	0.058139	0.019507	2.980452	0.0030
Return on assets	0.039835	0.014226	2.800140	0.0053
Company size	-0.012240	0.001128	-10.85282	0.0000
Q-Tubin	-1.49E-05	0.001663	-0.008950	0.9929
Financial leverage	-0.025954	0.011929	-2.175602	0.0300
Company age	-0.022994	0.004578	-5.023112	0.0000
Deterministic coefficient		0.696	Durbin-Watson	38.2
Adjusted Deterministic coefficient		0.75	F-probability level	00.0

$$IE_{i,t} = 0.220591 - 0.018892(LAC_{i,t}) + 0.058139(Cash_{i,t}) + 0.039835(ROA_{i,t}) - 0.012240(Size_{i,t})$$
$$- 1.49E - 05(Q_{i,t}) - 0.025954(Lev_{i,t}) - 0.022994(Age_{i,t}) + V_{i,t}$$

And the coefficient estimated by the software for the low agency cost variable is equal to -0.1889, and so with 95% confidence, this variable is significant in the regression model. The adjusted determination coefficient shows the explanatory power of independent variables that explicitly explains 75% of the variations of the dependent variable. As well as considering that the level of the F-item is less than 5%, the whole model is statistically significant. Therefore, the assumption H0 is rejected, that is, low agency cost is effective on the efficiency of the investment.

6 Discussion, Conclusion and Suggestions

This research seeks to find out the effect of financial constraints and different levels of agency costs on investment performance. The results of this study are in line with theoretical foundations and research background. According to Jensen and Mackling [6] the relationship is the contractual agency, according to which one or more owner (shareholder), someone else as representative or agent (manager) is appointed by him and authorizes him to make a decision. The formation of the relationship of agency causes the owner to delegate a degree of authority and decision power to the agent to use this authority to maximize the owner's wealth. However, due to differences in the owner-agent utility function, each of them seeks to maximize their utility. Therefore, executives probably have the motivation and ability to work towards raising their own personal interests. Consequently, the actions and

decisions of managers do not necessarily lead to maximizing the wealth and welfare of the owners. In addition, Dey et al. [3] stated that it is assumed that there is asymmetric information between the owner and the agent. Therefore, the relationship of agency is accompanied by conflicting interests that result from different goals and information asymmetries between the owner and the agent, and the combination of these two features probably hinders the growth of the wealth of the owners. In general, two dominated theories are discussed in cash, exchange theory, and hierarchical theory. According to Wang [13] the first theory, firms determine the optimal level of cash holding based on balances between benefits and cash holding costs. The three main motivations for keeping cash can be seen as the incentive for trading, prudential motivation and speculation. Kashanipour and Naghi Nejad [8] stated that in the second theory due to information asymmetry and signalling problems associated with external financing, a hierarchical financing procedure is followed, in which domestic resources are preferred to foreign sources and if more funds are needed for current positive value, the debt is settled and the cash assets are accumulated. Generally, in accounting studies, the sensitivity of cash flows is divided into two categories, one of which is the sensitivity of cash flow investments, which refers to the percentage of changes in corporate capital expenditures in relation to changes in cash flows, and the other in the statement is sensitivity cash flows are cash, which refers to the percentage change in cash holdings in relation to changes in cash flows. They argue that institutional investors increase investors' eagerness to intervene in current corporate monitoring, in addition to analysing firms, and thus reducing investment and exchange costs. Given the free cash flow theory posed by Jensen [7] internal cash flow allows managers to avoid market control. In this case, they do not need shareholders' consent and are free to decide on investments in their discretion. Managers who are not willing to pay cash (such as dividends) are motivated to invest, even when there is no investment with a net positive present value. In companies with poor shareholder's protection, managers can accumulate cash with relative immunity and divide cash profits [5].

Proposals based on the findings of research hypotheses According to the results of the analysis of the data based on the findings of each hypothesis, the suggestions are presented as follows:

According to the results of the review of the first main hypothesis, financial constraints affect the efficiency of investment. Therefore, by focusing on financial constraints of the company, one could hope to improve market efficiency, including on the efficiency of the investment. In addition to reassessing the financial situation, the findings emphasize the role of financial constraints in changing investment performance, which can be useful to standard-setting and stock brokers for the disclosure requirements of financial constraints through financial statements and accompanying notes. Managers will be able to benefit from the results of the research in deciding whether to provide their resources to companies, as well as how many resources and under what conditions this will take place.

According to the results of the first sub-hypothesis, the financial constraints is effective on the efficiency of investment on the basis of the index (kz). It is suggested to educational institutions and students to use the results of this research in comparative studies and other financial research, and investors, investment managers and financial suppliers use the results of this research to better predict the investment efficiency of their companies.

According to the results of the second sub-hypothesis, the financial constraints based on the WW index are effective on investment effectiveness. Therefore, financial constraints based on the (WW) index have information benefits and lead to a change in the efficiency of the investment. Therefore,

organizations must identify the factors affecting investment efficiency, including financial constraints, and pay due attention to these factors to promote organizational performance. It is recommended for all capital market players, decision makers, financial analysts and potential investors in the stock market companies to be actively involved in analysing investment plans in financial assets and securities to evaluate companies, risk, timing and due to the fact that this important factor leads to the selection of optimal investment portfolio with the minimum risk and the highest return, due to the different and heterogeneous levels of risk exposure, it is important to pay attention to the financial constraints.

According to the results of the second main hypothesis, the cost of agency is effective on investment effectiveness. Hence, it is suggested that the activists present in the capital market, while paying attention to the importance of agency costs, consider the findings of this research about long-term forecasts of investment efficiency. According to the results of the first sub-hypothesis, high agency costs are effective on investment efficiency. Therefore, the audit organizations and other regulatory and oversight bodies, in the formulation of accounting and financial standards, should pay more attention to the category of high agency costs and provide guidance to limit managers, users of financial information in order to make optimal and informed decisions. According to the results of the second sub-hypothesis, low agency costs are effective on investment efficiency. Considering that the main task of managers is the promotion of shareholders' equity to the maximum extent, therefore, managers should pay particular attention to the investment efficiency variable and implement investment forecast improvement strategies to increase the returns of investors.

References

[1] Arsalan, O., Florackis, C., Ozkan, A., *The Role of Cash Holdings in Reducing Investment-Cash Flow Sensitivity: Evidence from a Financial Crisis Period in an Emerging Market*. Emerging Markets, 2006, **7**(1), P.320 - 338.

[2] Biddle, G., Hilary, G., Verdi, R.S., *How does financial reporting quality relate to investment efficiency?,* Journal of Accounting and Economics, 2009,**4**(8), P.112-131.

[3] Dey A, *Corporate Governance and Agency Conflict,* Journal of Accounting Research, 2008, **46**(5), P.1143-1181.

[4] Guariglia, A., Yang, J., *A balancing act: Managingfinancial constraints and agency costs to minimize investment inefficiency in the Chinese market*, Journal of Corporate Finance, Journal of Corporate Finance, 2015, **36**(5), P.111–130.

[5] Izadiya N., Rasaiyan, A., *Some Organizational Guidance Tools and Economic and Financial Performance Measurement Criteria,* Journal of Accounting Knowledge, 2010, **1**(1), P.72-53.

[6] Jensen, M., Meckling, W., *Theory of the firm: managerial behaviour, agency costs and ownership structure,* Journal of Financial Economics,1976, **3** (4), P.305-360.

[7] Jensen, M. C, Agency costs of free cash flow, *Corporate finance and takeovers*, American Economic Review,1986, **76** (2), P.323-329.

[8] Kashanpoor M., Neginjad, B., *Investigating the effect of financial constraints on cash flow sensitivity*, Ac-

counting Research, 2009,**1**(2), P.72-93.

[9] Myers, S. C., *The Capital Structure Puzzle*, Journal of Finance,1984, **39**(3), P. 575-592.

[10] Roberts J., McNulty T, Stiles P., *Beyond Agency Conceptions of the Work of the Non-Executive Director: Creating Accountability in the Boardroom*, British Journal of Management, 2005, **1**(6), P. 5–26.

[11] Rocca M. L., Cariola A., Elvira T. L. R*., Overinvestment and underinvestment problems: Determining Factors, Consequences and Solution*, 2005, **7**(9), P.967-1010.

[12] Verdi, R*., Financial reporting quality and investment efficiency. Unpublished PhD Dissertation, Faculties of the University of Pennsylvania in Partial Fulfilment*, OR Working paper, 2006. **8**(2), P.152-157.

[13] Wang F., *Corporate Liquidity and Equity Retunes*, Working Paper, 2005.

[14] Yang, J., Jiang, Y., *Accounting information quality, free cash flow and overinvestment: A Chinese study, The Business Review*, 2008, **11** (1), P.159-166.