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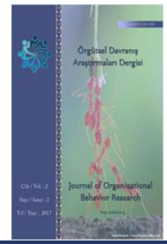

THE INFLUENCE OF FINANCIAL CONSTRANTS AND CAPITAL COST IN INVESTORS SENTIMENTS IN TEHRAN

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ABSTRACT

This study aims to examine the influence of financial constraints and capital cost of investors sentiment in the listed companies in Tehran stock exchange during 2009 to 2015. Totally, the given statistical method is based on correlation and multiple regression method in this research. The hypotheses were examined through the obtained results from econometric patterns and multi-variate regression. To investigate the significance of independent variable coefficient in each pattern, t-student statistics is used in 95% confidence level. Based on systematic elimination method, 107 firms were selected as the statistical sample of the research. The results showed that there is a significant relationship between capital cost and investors sentiments in the listed companies on Tehran stock exchange. There is also a significant relationship among measured financial constraints based on Zingales & Kaplan (KZ) index and investors sentiments in the listed companies on Tehran stock exchange. Between measured financial constraints based on White & Wu (WW) index and investors sentiments, there is no significant relationship in those firms.

Keywords: *Financial Constraints- Capital Cost- Investors Sentiments.*

INTRODUCTION

Behavioral finance is one of the studies has rapidly expanded in this field, and examines investors' decision-making process and their reactions to different situation of financial markets. Behavioral finance emphasizes more on the impact of sentiments, personality, culture and investors' judgement on investment decision-making. Behavioral finance view indicates that there is no fundamental reason behind changes of securities price, and investor's sentiments plays the main role in prices determination (Kim & Ha, 2010). In one side, capital cost is one of the important factors. The cost of shareholders' equity is important as an index or criterion for investment decision-making, creating optimized capital structure, measuring performance indices, and decreased future cash flow for value determination. In this regard, recognizing effective factors on the cost of shareholders' equity and finding some ways for controlling and decreasing this cost are important. Generally, there are two sets of controllable and uncontrollable factors affect capital cost. Uncontrollable factors such as inflation and macroeconomic policies, and controllable factors such as debt ratio, firm size, liquidity, growth and etc. are among the common factors (Afrasiabi, 2006).
Tehrani & Hesarzadeh (2009) examined the influence of free cash flow and financial limitations on overinvestment and underinvestment. In one hand, free cash flows are lead to overinvestment due to information asymmetry between managers and shareholders. On the other hand,

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financial constraints led to underinvestment. This research is conducted using financial information of the listed companies in Tehran stock exchange during 2000 to 2006. Its results showed that there is a significant relationship between free cash flows and overinvestment, and their relationship is statistically significant.

Resaeian & Hosseini (2008) have examined the relationship between accruals and capital cost of the listed companies in Tehran stock exchange during 1997 to 2005. In this research, accruals quality was examined based on the two categorizations of discretionary accruals and non-discretionary accruals. The findings indicated that capital cost of firms is not influenced by accruals quality and its related components, i.e. it can't be accepted that there is a significant relationship between capital cost of firms with poor and low accruals quality in comparison with firms having good and suitable accruals quality.

Zh'u & New (2016) investigated the common effect of investors' sentiments and disclosure of accounting information on stock price in China during 2002 to 2011. Their results suggested that investors' sentiments can change the expected earnings growth and the expected returns. It affects, Therefore, stock price. Additionally, accounting information and investors' sentiments jointly affect stock price. It can be said that the influence of accounting information is related to stock price.

In their research, Yang et al., (2012) examined the influence of financial constraints and agency cost on investors' efficiency, and the results showed that firms with more desirable free cash flow are more likely to overinvestment due to agency costs, and firms with less desirable free cash flow are more likely to underinvestment due to financial constraints.

Barth et al, (2009) examined the impact of accounting information transparency in capital cost. Their results demonstrated that increasing in accounting information transparency leads to decreasing in capital cost. The found negative relationship between shareholders' equity and accounting information transparency is higher significant than the other related research in this field.

There is a significant relationship between capital cost and investors' sentiments of the listed companies in Tehran stock exchange and between financial constraints and investors' sentiments of the listed companies in Tehran stock exchange.

The locative domain of this research includes the listed companies in Tehran stock exchange. This time domain of this research is during 2009 to 2015.

Since the current study deals with the relationship between financial constraints and capital cost with investors' sentiments of the listed companies in Tehran stock exchange, and its results are applicable, it is based on practical researches in terms of the goal of the study. This is also a kind of descriptive-correlation and post-event research due to using historical information.

STATISTICAL POPULATION AND SAMPLE

The statistical population of the current research includes all listed companies in Tehran stock exchange. According to the announcement of Tehran stock exchange formal website, the listed companies were 520 by the end of 2015. Therefore, all listed companies in Tehran stock exchange during 2009 to 2015 are the statistical population.

To select the sample, the systematic elimination method is used and it should have the following criteria:

According to the necessary information from 2009, the firms should not be eliminated until the end of March. Their stocks should be actively traded during the given time. To increase the comparability of the studied firms, their fiscal year should be ended in 19/03 and their fiscal period should not be changed. They should not be the part of financial intermediaries (investment, holding, leasing, banks and insurance) due their different performance. Their required information should be available. The required information and data have been collected through the two methods:

The information related to the research's theoretical issues have been collected from different resources such as valid international books and journals which are available in online websites. The required information and data have been collected through direct referral to firms' financial statements available in published CD from Tehran stock exchange and its websites to test the hypotheses.

Firms' financial statements such as balance sheet, income statement, cash flow statement and notes to financial statement at the end of each fiscal year are considered the research tools. In this research, EVIES and Excel software is used to estimate descriptive and statistical statistics as well as the current models' parameters.

OPERATIONAL DEFINITION OF THE VARIABLES

Dependent variables

Investors' sentiments: To measure the investors' sentiments, capital market sentiments index has been used in this study. This index was generalized by Jones and adjusted by Persaud (Bandopadhyaya and Jones 2006). Therefore, investors' sentiments can be calculated by the following relationship:

$$EMSI_{pt} = \frac{\sum(R_{it} - \bar{R}_r)(R_{tv} - \bar{R}_v)}{[\sum(R_{it} - \bar{R}_r)^2 \sum(R_{tv} - \bar{R}_v)^2]^{\frac{1}{2}}} \times 100, -100 \leq EMSI \leq +100$$

Where:

Rit: Monthly return rate of the firm i in the month t

Riv: Historical volatility rate of the firm i in the month t

To calculate historical volatility, mean SD of stock return during a five months period is used.

Rr: Mean monthly return rate of portfolio firms

RV: Mean historical volatility rate of portfolio firms

Independent variable

- ***Capital cost***

  In fact, it is the rate of return which the firm should obtain in order to provide the expected return of investors, and to maintain the stock's market value (Karbalaei, 2011). Since financial structure of firms usually includes different resources, capital cost of all resources is considered in calculating weighted mean, therefore, each group requires part of rate of return with related risk.

  To calculate the weighted mean rate of capital cost, the following formula is used:

$$\mathrm{WACC} = [\mathrm{W_d} \times \mathrm{K_d}(1 - \mathrm{T})] + (\mathrm{W_e} \times \mathrm{K_e})$$

In the above relationship:
Wd: Weight of debt in firm's capital structure
Kd: Finance cost through debt
T: Firm's tax rate
We: Weight of common stock in firm's capital structure
Ke: Finance cost through common stock.

- ***Financial constraints***

Lensink (2006) refers "financial constraints" to firms which have less and costly availability to external finance. Information asymmetry and agency problems are the main reasons of the difference between internal and external finance.
In this investigation, two variables are used to measure financial constraints:
Zingales & Kaplan (KZ) index of financial constraints is as follow:

$$\mathrm{KZ_{IR}} = 17.330 - 37.48\mathrm{C} - 15.216\mathrm{Div} + 3.394\mathrm{Lev} - 1.402\mathrm{MTB}$$

C: Cash to assets ratio
Div: Dividend on assets
Lev: Leverage
This index is used in a way that real amounts are entered into KZ index, and it is calculated. These amounts are arranged based on the smallest to biggest, then divided into 5 parts.
WW index provided by White & Wu for measuring constraints in financing. Ebrahimi Kord et al, (2008) localized it fir the listed companies in Tehran stock exchange during 2000 to 2006.
$WW_{ir} = 80.04 - 5.182\ cfo - 0.106\ Div + 5.112\ Lev - 0.662\ LogT$
Div: Dividend on assets
Lev: Leverage
CFO: Cash flow divided by total assets at the end of each period.
LogTA: Natural logarithm of total assets.
This index is used in a way that real amounts are entered into WW index, and it is calculated. These amounts are arranged based on the smallest to biggest, then divided into 5parts.
KZ and WW indices are used to measure financial constraints.

Control variables

Size: Firm size calculated by natural logarithm of total assets.

ROA: Firm's ROA equals with net profit to total assets ratio.

LEV: Financial leverage equals with total debt to total assets ratio.

STATISTICAL MODEL OF THE RESEARCH

The regression model for the first hypothesis is:

$$EMSI = B0 + B1 * WACC + B2 * size + B3ROA + B4 * LEV + \varepsilon$$

The regression model for the second hypothesis is:

$$EMSI = B0 + B1*WACC + B2*SIZE + B3ROA + B4*LEV + \varepsilon$$
$$EMSI = B0 + B1*WW + B2*SIZE + B3ROA + B4*LEV + \varepsilon$$

EMSI: Investors' sentiments

WACC: Weighted Average Cost of Capital

KZ, WW: Financial constraints

Size: Firm size

ROA: Return on Assets

ER: Error level

DATA ANALYSIS METHOD

These statistics is discussed in two areas of descriptive and inferential statistics. Probabilities and their related theories is beyond our discussion. Descriptive statistics such as frequency, mean, variance, etc. are also assumptions. To test the hypotheses, panel data are used in this study. Time series (studied years) and cross-sectional data (studied firms) are mixed. Panel data are used due to increased observations number, increasing freedom degree, decreasing heteroscedasticity and studying changes dynamic. To estimate the efficiency of a regression model through panel data, one of the common effects, fixed effects and random effects model is used via suitable tests, Firstly, to determine whether time series x_t is stationary process (zero accumulation times) and/or divergent (one accumulation times), Lin-Levene test is used. We use modified Wald statistics to examine group heteroscedasticity among remaining of fixed effects regression model. As well, F and Hausman test are used to determine of fixed effects or random effects model. To illustrate the explanatory power of the explanatory variables, coefficient of adjusted determination (adjusted R^2) will be used to evaluate significant variables, t-statistics and to assess the overall adequacy of the model, F-Fisher statistical is used. As well, statistical analyses will be performed through EXCEL and EVIEWS 9.

DESCRIPTIVE STATISTICS

Table 1. Central and distribution indices of each variables

Variable	Investors' sentiments	Capital cost	KZ	WW	Firm size	ROA	Financial leverage
Average	0.513	0.297	9.625	7.622	12.537	0.198	0.615
Mean	0.535	0.286	9.609	8.599	12.351	0.191	0.713
Max	3.308	0.427	17.206	15.783	14.681	0.887	0.955
Min	-1.097	0.091	4.364	2.288	10.594	-0.450	0.120
SD	0.274	0.190	0.159	0.318	1.008	0.189	0.238
Skewness	-3.282	0.380	0.162	2.243	0.511	-0.799	-0.558
Kurtosis	14.175	1.837	1.977	9.086	2.566	4.705	2.143
Number of observations	749						

According to data of these descriptive statistics, the average investors' sentiments is 0.513. The average financial constraints for KZ and WW are 9.625 and 9.609, respectively. The average of capital cost is 0.297. The average of firm size, financial leverage and return on assets are 12.537, 0.615 and 0.198, respectively.

Data normality test

Table 2. Jarque-Bra test before Normalization

Variable	Statistics	Significance level
Investors' sentiments	147.0044	0.000
Capital cost	1.689449	0.429
KZ	1.007326	0.604
WW	50.03049	0.000
Firm size	1.080018	0.582
ROA	4.672257	0.196
Financial leverage	1.732002	0.420

5% error level

According to the above table, due to the significance level of investors' sentiments and financial constraints through WW is less than 0.05, so the distribution of the variables is not normal. Significant level of the other variables is bigger than 0.05, so the distribution of other variables is normal. The abnormal variables are provided in the below table.

Table 3. Jarque-Bra test after normalization

Variable	Statistics	Significance level
Investors' sentiments	12.12691	0.952
WW	15.36975	0.321

Table 4. Lin & Levene test

Investors' sentiments	Statistics	Significance level
Investors' sentiments	5.0301	0.0087
Capital cost	-2.3251	0.0017
KZ	7.8163	0.0014
WW	5.0621	0.0008
Firm size	-6.3748	0.0008
ROA	8.6133	0.0029
Financial leverage	-7.0344	0.0053

5% error level

Regarding the above table, H0 is rejected and all variables of the study are durable.

Table 5. The results of F-Limer test

	Statistics	Freedom degree	Significance level
F-Limer	2.195623	106.72	0.0005

5% error level

According to the above table, F-Limer test results are less than 0.05, indicating H_0 is rejected.

Table 6. The results of Hausman test

Hausman	Statistics	Freedom degree	Significance level	Test results
	5.603221	27	0.0087	Fixed effects

5% error level

Due to the results of Hausman test is less than 5%, so fixed effects method should be used in the related regression model.

Examining heteroscedasticity

Table 7. The results of heteroscedasticity of LM Arch model

Hypothesis	Description	Statistics amount	Significance level
LM	F-statistics	0.603251	0.0532
	Chi-square	4.189963	0.0532

5% error level

- *The first hypothesis*

  H_0: There is no significant relationship between capital cost and investors' sentiments in the listed companies on Tehran stock exchange.

  H_1: There is a significant relationship between capital cost and investors' sentiments in the listed companies in Tehran stock exchange.

Table 8. The first hypothesis test

Variable	Estimation coefficient	Standard deviation	t-statistics	Significance level
Y-intercept	0.309	0.088	3.511	0.0475
Capital cost	-0.522	0.052	-10.613	0.0000
Firm size	0.926	0.101	9.168	0.0003
ROA	0.714	0.135	5.228	0.0365
Financial leverage	-0.123	0.108	-1.138	0.0962
Durbin-Watson	Coefficient of determination	Adjusted coefficient of determination	F-statistics	Significance level
1.9	0.52	0.51	41.05738	**0.000

* %5 error level, **% error level

According to the table 8-4, Durbin-Watson statistic is 1.9, indicating there is no correlation between errors, because it is between 1.5 to 2.5. The adjusted coefficient of determination is 0.51, indicating independent and control variables can predict 51% of the dependent variables (investors' sentiments). Due to significance of f-statistics in 1% error level, it can be said that the research's model is statistically suitable and significant.

The coefficient of determination of investors' sentiments is -0.552, indicating there is a reverse and negative relationship between capital cost and investors' sentiments. It means that increased capital cost occurs along with decreased investors' sentiments. The impact of control variables of firm size and ROA is positive on investors' sentiments. The control variable of financial leverage doesn't impact on investors' sentiments due to significance level of t-statistics is less than 5% error level. Finally, because significance level of t-statistics is less 5% error level, it can be said with 95% confidence level that there is a significant relationship between capital cost and investors' sentiments in the listed companies in Tehran stock exchange. So, the estimated model is:

$$EMSI = 0.309 - 0.552WACC + 0.926size + 0.714ROA - 0.123LEV + \varepsilon$$

- *The second hypothesis*

  H_0: There is no significant relationship between financial constraints (KZ) and investors' sentiments in the listed companies in Tehran stock exchange.

  H_1: There is a significant relationship between financial constraints (KZ) and investors' sentiments in the listed companies in Tehran stock exchange.

Table 9. Regression model and significance of the second model

Variable	Estimation coefficient	Standard deviation	t-statistics	Significance level
Y-intercept	0.105	0.282	0.465	0.1718
Financial constraints	-0.734	0.121	-6.066	0.0152
Firm size	0.617	0.141	4.375	0.0269
ROA	0.822	0.178	4.617	0.0315
Financial leverage	-0.214	0.216	-0.996	0.1621
Durbin-Watson	Coefficient of determination	Adjusted coefficient of determination	F-statistics	Significance level
1.8	0.74	0.77	36.65612	**0.000

* %5 error level, **% error level

According to the table 9-4, Durbin-Watson statistic is 18, indicating there is no correlation between errors, because it is between 1.5 to 2.5. The adjusted coefficient of determination is 0.77, indicating independent and control variables can predict 77% of the dependent variables (investors' sentiments). Due to significance of f-statistics in 1% error level, it can be said that the research's model is statistically suitable and significant. The coefficient of determination of financial constraints (KZ) on investors' sentiments is -0.734, indicating there is a reverse and negative relationship between capital cost and investors' sentiments. It means that increased financial constraints occur along with decreased investors' sentiments. The impact of control variables of firm size and ROA is positive on investors' sentiments. The control variable of financial leverage doesn't impact on investors' sentiments due to significance level of t-statistics is higher than 5% error level. Finally, because significance level of t-statistics is less 5% error level, it can be said with 95% confidence level that there is a significant relationship between financial constraints (KZ) and investors' sentiments in the listed companies in Tehran stock exchange. So, the estimated model is:

$$EMSI = 0.105 - 0.734KZ + 0.617SIZE + 0.822ROA - 0.214LEV + \varepsilon$$

- ***The third hypothesis***

  H_0: There is no significant relationship between financial constraints (WW) and investors' sentiments in the listed companies in Tehran stock exchange.

  H_1: There is a significant relationship between financial constraints (WW) and investors' sentiments in the listed companies in Tehran stock exchange.

Table 10. Regression model and significance of the second model

Variable	Estimation coefficient	Standard deviation	t-statistics	Significance level
Y-intercept	0.350	0.088	3.988	0.0332
Financial constraints (WW)	-0.518	0.420	-1.233	0.1079
Firm size	0.735	0.147	5.006	0.1623
ROA	0.332	0.048	6.916	0.0051
Financial leverage	-0.122	0.114	-1.071	0.1502
Durbin-Watson	Coefficient of determination	Adjusted coefficient of determination	F-statistics	Significance level
2.05	0.55	0.53	48.45465	**0.000

* %5 error level, **% error level

According to the table 10-4, Durbin-Watson statistic is 18, indicating there is no correlation between errors, because it is between 1.5 to 2.5. The adjusted coefficient of determination is

0.53, indicating independent and control variables can predict 53% of the dependent variables (investors' sentiments). Due to significance of f-statistics in 1% error level, it can be said that the research's model is statistically suitable and significant. The coefficient of determination of financial constraints (WW) on investors' sentiments is -0.518, indicating there is a reverse and negative relationship between capital cost and investors' sentiments. It means that increased financial constraints (WW) occur along with decreased investors' sentiments. The impact of control variables of firm size and ROA is positive on investors' sentiments. The control variable of financial leverage doesn't impact on investors' sentiments due to significance level of t-statistics is less than 5% error level. Finally, because significance level of t-statistics is higher 5% error level, it can be said with 95% confidence level that there is no significant relationship between financial constraints (WW) and investors' sentiments in the listed companies in Tehran stock exchange. So, the estimated model is:

RECOMMENDATIONS & SUGGESTIONS

Recommendation based on the results of the hypotheses

- Capital cost is increased when it leads to decreased firm's profits, and stock price and stock return, which finally results in behavioral dissatisfaction of investors in long-term periods.
- When firms need cash, they should provide their financial resources externally and internally. Most firms seek to provide their financial resources from outside of their organization and banks. Governments and organizations should provide their finance through imposing suitable policies. The firms providing their finance though inside of their organizations should be referred by shareholders and investors, because they led to increased stock price and stock return, and shareholders have positive approach to the future of the firm.

Suggestions of future researches

- It can be suggested that the future researches should be dealt with the impact of financial constraints and capital cost on investment decisions in the listed companies in Tehran stock exchange.
- It can be recommended that the future researches should be dealt with the influence of financial stability and capital cost on investment decisions in the listed.

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