

STUDY OF THE RELATIONSHIP BETWEEN OVERINVESTMENT, LEVERAGE, AND LIQUIDITY IN COMPANIES LISTED IN TEHRAN STOCK EXCHANGE

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Abstract: This study was conducted aimed at examining the effect of companies' liquidity and leverage on their overinvestment. Surplus liquidity can affect the financial behavior of companies and accompany them in generating overinvestment in projects. Likewise, the increase in capital of the companies can play a significant role in increasing their leverage. This study sought to answer two main questions: 1) what effect does companies' leverage have on overinvestment in projects, and 2) what effect does companies' liquidity have on the relationship between leverage and overinvestment? In this causal-comparative study, the analysis was performed on the basis of panel data and multiple linear regression. Data from 118 companies was collected during 2013-2017. Data analysis and hypothesis

testing were performed using EXEL and EVIEWS software. According to the findings, there was a significant relationship between companies' liquidity and leverage with overinvestment. In addition, the results indicated that companies' liquidity had no effect on the relationship between leverage and overinvestment.

Keywords: the companies' liquidity, leverage, overinvestment, financing.

1. Introduction

The availability of financial resources affects the companies' capital. A review of the literature suggests that when companies' financial conditions are favorable, their capital increases (Almeida, 2012). This can create problems for companies, as high

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liquidity in addition to increasing investment in companies can cause overinvestment. Overinvestment in companies is a matter between shareholders and managers of companies (Officer, 2012). Based on the free cash flow theory, excess cash flow in companies can cause managers to invest in projects with negative net present value (NPV) and increase the resources under their control to receive more rewards (Bates, 2005). Liu et al. (2018) showed that when capital is readily available and financial costs are low, the problem of overinvestment in companies occurs. Among the factors affecting sustainable economic growth and development, effective investment can be mentioned. In order to invest in different projects, an entity must consider the extent or amount of investment due to the resource constraint. This is done through methods for projects evaluation, including net present value. According to this method, an investment is made in one or more projects when their net present value is positive. So undertaking projects with negative NPV results in overinvestment, and neglecting projects with positive NPV leads to underinvestment that will

lead to non-optimal investment (Verdi, 2006). This is because managers must optimally invest in projects that create value for the company. That is, projects with positive NPV must be accepted and those with negative NPV must be rejected (Young et al., 2008).

2. Literature Review

This study was conducted aimed at examining the effect of companies' liquidity and leverage on their overinvestment. Over the past two decades, the financial decisions of companies have changed depending on different factors, and countries have sought to provide better conditions for corporate investment through deregulation so that they have more financial and liquidity to create their own investment projects. This study sought to answer two main questions: 1) what effect does companies' leverage have on overinvestment in projects, and 2) what effect does companies' liquidity have on the relationship between leverage and overinvestment? Surplus liquidity can affect the financial behavior of companies and accompany them in generating overinvestment in projects (Justiniano, et al., 2015). Likewise, the

increase in capital of the companies can play a significant role in increasing their leverage (Leary, 2009).

Leary (2009) suggests that leverage ratios play an important role for shareholders in investment decisions and that decisions on leverage can positively affect the companies' liquidity. This has been confirmed in most conducted studies (Zeitun et al., 2017). Myers (1997) analyzed the impact of factors caused by debt on the optimal investment strategy of shareholders and managers. He said that with the increase in debt, shareholder-manager coalition incentives to control the company would decrease for investment in opportunities with positive NPV, as the benefits of such investment is transferred to creditors rather than shareholders. So companies with higher leverage - compared to those with lower leverage - will have less opportunity to grow. The leverage contains a warning indicating managers' information on investment opportunities. Capital structure theories suggest that managers of companies having proper growth opportunities should choose less leverage because they will not be able to use the advantages of their investment opportunities if they

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increase their levels of external debt. The result is a negative relationship between future growth and leverage, because managers of companies with high growth opportunities will choose the low leverage. Such results can be found in regressions that control the growth opportunities (Noravesh et al., 2014).

Given the above, this study sought to answer two main questions: 1) what effect does companies' leverage have on overinvestment in projects, and 2) what effect does companies' liquidity have on the relationship between leverage and overinvestment?

The following are some of the related internal and external studies:

In their study, Lopez et al. (2018) examined the relationship between overinvestment, leverage, and liquidity of companies. They selected 12,400 companies from 25 EU countries during 2003-2014. According to the results, there was a positive relationship between leverage and overinvestment in companies. In the case of surplus liquidity of companies, the effect of leverage on overinvestment was confirmed.

Omutla et al. (2017) studied the effect of leverage on investment

efficiency in emerging markets. The results indicated that there was a significant positive relationship between leverage and investment inefficiency. So it can be concluded that the increase (decrease) in the leverage on the one hand will lead to increase (decrease) in the investment inefficiency and on the other hand will decrease (increase) the investment efficiency.

Dehghan Manshadi et al. (2017) conducted a study titled "The effect of Leverage and Liquidity on Earnings and Capital Management in Selected Commercial Banks in Tehran Securities Exchange". In this study, the researcher investigated the effect of leverage and liquidity on earnings and capital management in selected commercial banks listed on the Tehran Stock Exchange by analyzing data on 11 selected banks during 2010 to 2015. The results of data analysis were provided in three sections. In the first section, it was found that leverage had a significant reverse effect on earnings and capital management. In the second section, it was stated that there was no significant relationship between liquidity and earnings and capital management. In the third section, the authors found that

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international sanctions on the Iranian financial system had no significant effect on the earnings and capital management behavior of the banks listed on the Tehran Stock Exchange.

Taherabadi et al. (2016) conducted a descriptive-applied study titled "Investigating the Impact of Investment Intensity on Leverage in Companies Listed in Tehran Stock Exchange" using content analysis method. This study was conducted to investigate the Impact of investment intensity on leverage in companies listed in Tehran Stock Exchange. Data were collected using library resources and online articles. Findings indicated that investment intensity had a significant impact on leverage. The results of the study were consistent with the idea that companies invest in non-profitable projects with negative NPV as the debt (leverage) increases, which reduces the value of the company.

3. The Study Hypotheses and Model

According to the theoretical framework, the following hypotheses were developed:

1. There is a significant relationship between leverage and overinvestment.

2. There is a significant relationship between liquidity and overinvestment.

3. Liquidity affects the relationship between leverage and overinvestment.

In this study, the following conceptual model was used to calculate management ability based on the study by Andrew et al. (2017):

$$OWERI_{it} = \alpha_0 + \beta_1 LEV_{it} + \beta_2 (LEV_{it} * LIQ_{it}) + \beta_3 LIQ_{it} + \beta_4 FCF_{it} + \beta_5 SIZE_{it} + \beta_6 ROA_{it} + \beta_7 AGE_{it} + \varepsilon$$

Where:

OWERI: Overinvestment

LEV: Leverage

LIQ: Liquidity

FCF: Free Cash Flow

SIZE: Size of company

ROA: Return on assets

AGE: Age of company

4. Methodology

This was a correlational-descriptive study. The correlational study measures the relationship between two or more variables. This study seeks to expand the theoretical literature on the

management ability and investment efficiency. It has a causal-comparative method of reasoning. In this study, panel data were used to analyze the data collected.

5. Operational Definition of Variables

Overinvestment:

In this study, the following equation was used to calculate overinvestment (Chen et al., 2017):

$$Invest_{it} = \beta_0 + \beta_1 SaleGrowth_{it-1} + \varepsilon_{it}$$

Where:

Invest: Total investment of the company i in the year t.

Sale Growth: Sales changes rate

ε_{it} : Model residuals

If the model residuals are positive, this indicates overinvestment.

Leverage:

It is the debt to assets ratio and, as one of the control variables, is calculated as follows: The total debt of the company is calculated in a financial period and then divided by the total assets of the company.

Liquidity:

It is the net cash inflow and outflow of the company.

Size of the company:

In this study, natural logarithms of end-of-period assets of each company were used to calculate size of the company.

Return on assets:

It is the ratio of net profit to total assets of the company.

Age of company:

It was the date of establishment of the company until 2017.

6. Data Analysis

The population and sample

The statistical population of the study consisted of companies listed in Tehran Stock Exchange. The sample was

selected from the following companies by applying the following criteria:

1. Companies listed in the Tehran Stock Exchange by the end of 2012
2. The availability of the company's financial information for the years 2013 to 2017
3. Fiscal year ending March to increase comparability
4. Not belonging to a particular group including investment companies, financial intermediaries, banks and leasing companies

The following table shows how to select companies:

520	All companies listed in Tehran Stock Exchange until 19.03.2017
(44)	Companies listed in Tehran Stock Exchange after 2012
(124)	Companies suspended or excluded from the Tehran Stock Exchange during the study period
(92)	Companies whose fiscal year did not end on March 29 or those that changed their fiscal year
(18)	Financial intermediaries (investment, holding and leasing companies, and banks) ³
(89)	Companies whose shares were not actively traded on the Tehran Stock Exchange during the study period

³. Insurance companies were excluded after applying the first, second and third criteria.

<u>(51)</u>	Companies whose data was insufficient to obtain some variables
<u>118</u>	The whole testable sample considering the criteria

Descriptive Statistics:

Rahavard Novin software and corporate financial statements were used to produce Table 2. The values of the other variables are also given in Table 2.

In this study, descriptive statistics were statistical indices including mean, standard deviation, maximum, minimum and median. They were in accordance with Table 4-1 for the variables:

Table 2: Descriptive statistics of variables

Age of company	Return on assets	Size of company	Free cash flow	Liquidity	Average	Investment	Description
AGE	ROA	SIZE	CF	LIQ	EV	WRI	
3	0	6	0			0	Mean
3.21	.12	.11	.13	.12	.61	.04	
3	0	6	0			0	Median
6.00	.10	.05	.03	.00	.59	.05	
6	0	8	7			1	Maximum
2.00	.67	.32	.83	.50	.77	1.44	
8	-	4	0			-	Minimum
.00	0.81	.79	.00	0.30	.07	39.87	
1	0	0	0			2	Standard deviation
5.70	.17	.55	.48	.22	.25	.18	
-	-	1	1			-	Kurtosis
0.14	0.18	.13	2.16	.35	.21	13.07	

As can be seen in Table 4-1, the mean overinvestment was 0.04 and the mean leverage was 0.61. According to the table, the mean liquidity, the liquidity to fixed assets ratio, was 0.12 and the mean free cash flow was 0.13. Other variables are given in Table 4-1.

Testing hypotheses:

In the following table, the hypotheses were tested according to the study model:

Table 3. Testing hypotheses

$OWERI_{it} = \alpha_0 + \beta_1 LEV_{it} + \beta_2 (LEV_{it} * LIQ_{it}) + \beta_3 LIQ_{it} + \beta_4 FCF_{it} + \beta_5 SIZE_{it} + \beta_6 ROA_{it} + \beta_7 AGE_{it} + \varepsilon$					
P-value.	T-statistic	Standard deviation	Coefficient	Variable	
0.28	-1.09	1.20	-1.31	Constant coefficient	C
0.02	2.27	0.48	1.09	Leverage	LEV
0.39	0.87	0.00	0.00	Leverage * Liquidity	LEV*LIQ
0.00	2.87	0.00	0.02	Liquidity	LIQ
0.63	0.48	0.20	0.10	Free cash flow	FCF
0.02	3.16	0.19	0.03	Size	SIZE

0.00	3.12	0.74	2.31	Return on assets	566 R OA
0.01	2.65	0.01	0.20	Age	A GE
Model statistics					
P-value.	F	Durbin-Watson	Adj. R-squared	R-squared	
0.0000	11.23	2.22	0.51	0.52	

The results of model estimation indicated that the P-value was 0.0000 and the F-value was 11.23. So with a confidence of 95% it can be said that the model was significant. The value of Watson camera statistic was 2.22, so the assumption of the correlation between residuals is rejected. In addition, the adjusted coefficient of determination of the model was 51%, indicating that the independent and the control variables explained for 51% of the dependent variable.

5. Findings

The first hypothesis:

The first hypothesis was tested, after validation of the model. P-value of the leverage for companies listed in the

Tehran Stock Exchange was 0.02. Since this value was less than 05, the first hypothesis, i.e. there is a significant relationship between leverage and overinvestment, was confirmed. Thus, the leverage of companies increases, their overinvestment increases. The constant coefficient value for the leverage was 1.09 and positive, indicating that there was a direct relationship between leverage and overinvestment.

The second hypothesis:

In the second hypothesis, the relationship between liquidity and overinvestment of companies was investigated. The p-value of liquidity for the companies listed in the Tehran Stock Exchange was 0.00. Since this value was

lower than 05, the second hypothesis, i.e. there is a significant relationship between liquidity and overinvestment, was confirmed. The constant coefficient value for the liquidity was 0.02 and positive, indicating that there was a direct relationship between liquidity and overinvestment.

The third hypothesis:

The third hypothesis was tested, after validation of the model. According to the model, the p-value of the leverage * liquidity for the companies listed on the Tehran Stock Exchange was 0.39. Since this value was greater than 05, the third hypothesis, i.e. liquidity affects the relationship between leverage and overinvestment, was rejected.

6. Conclusion

The Results of Testing the First Hypothesis

In the first hypothesis, it was investigated whether the liquidity of the company can moderate the relationship between leverage and overinvestment. This hypothesis was developed on the basis that leverage ratios play an important role for shareholders in

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investment decisions and that decisions on leverage can positively affect the companies' liquidity. This has been confirmed in most conducted studies. The availability of financial resources affect the companies' capital. A review of the literature suggests that when companies' financial conditions are favorable, their capital increases. This can create problems for companies, as high liquidity in addition to increasing investment in companies can cause overinvestment. Overinvestment in companies is a matter between shareholders and managers of companies. According to the results of this study, there was a significant relationship between leverage and overinvestment. Since its constant coefficient was positive, with an increase in the leverage of companies, their overinvestment increased.

In comparing this study with other domestic ones, the study by Taherabadi et al. (2016) can be noted. They conducted a study titled "Investigating the Impact of Investment Intensity on Leverage in Companies Listed in Tehran Stock Exchange". The results indicated that there was a significant relationship between leverage

and overinvestment which were consistent with those of this study. In addition, in external studies, Lopez et al. (2018) examined the relationship between overinvestment, leverage, and liquidity of companies. The results suggested that there was a positive relationship between leverage and overinvestment, which were in line with those of this study.

The Results of Testing the Second Hypothesis

In the second hypothesis, it was investigated whether there was a significant relationship between liquidity and overinvestment. This hypothesis was developed on the basis that increasing the cash flow of companies can increase their overinvestment. Surplus liquidity can affect the financial behavior of companies and accompany them in generating overinvestment in projects. High liquidity in addition to increasing investment in companies can cause overinvestment. When capital is readily available and financial costs are low, the problem of overinvestment in companies occurs. Some managers may behave opportunistically due to the company's high liquidity. This can result in

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overinvestment and reduce the efficiency of the company's projects. So in this study, it was assumed that surplus liquidity could lead to overinvestment. According to the results, the liquidity of the companies listed in Tehran Stock Exchange was 0.00. This was less than 0.05, so the second hypothesis, i.e. there is a significant relationship between liquidity and overinvestment, was confirmed. The constant coefficient value for liquidity was 0.02. and positive, indicating that there was a direct relationship between liquidity and overinvestment, and with the increase in cash flow, overinvestment also increased.

In comparing this study with other domestic ones, the study by Noravesh et al. (2014) can be noted. They conducted a study titled "The Impact of Leverage on Firm Investments in Tehran Stock Exchange". According to the results, there was a significant relationship between liquidity and overinvestment, which were consistent with those of this study. In addition, in external studies, Lopez et al. (2018) examined the relationship between overinvestment, leverage, and liquidity of companies. The results suggested that

there was a positive relationship between cash flow and overinvestment, which were in line with those of this study.

The Results of Testing the Third Hypothesis

In the third hypothesis, it was investigated whether liquidity could moderate the relationship between leverage and overinvestment. This hypothesis was developed on the basis that leverage ratios play an important role for shareholders in investment decisions and that decisions on leverage can positively affect the companies' liquidity. This has been confirmed in most conducted studies. The availability of financial resources affect the companies' capital. A review of the literature suggests that when companies' financial conditions are favorable, their capital increases. This can create problems for companies, as high liquidity in addition to increasing investment in companies can cause overinvestment. Overinvestment in companies is a matter between shareholders and managers of companies. Based on the free cash flow theory, excess cash flow in companies can cause managers to invest in projects

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with negative NPV and increase the resources under their control to receive more rewards. Researchers state the problem of overinvestment in companies arises when capital is readily available and financial costs are low. Based on the results of the study, it could be found that liquidity could not have a significant effect on the relationship between leverage and overinvestment of companies.

In comparing this study with other ones, the study by Lopez et al. (2018) can be mentioned. They examined the relationship between overinvestment, leverage, and liquidity of companies. The results suggested cash flow could have a significant positive effect on leverage and overinvestment.

7. Recommendations

Based on the hypotheses tested in the previous section, this section provides the following general conclusions:

Following the confirmation of first hypothesis, i.e. there is a significant relationship between leverage and overinvestment, the following recommendations are made:

1. Companies listed in the Tehran Stock Exchange are recommended to adjust their finance management as well as their debt ratios in order to avoid overinvestment in projects so that they can improve investment efficiency.

2. Shareholders are recommended to consider investment efficiency of companies in their fundamental analysis because companies with overinvestment efficiency have higher profitability in investment projects.

Given the confirmation of the second hypothesis, i.e. there is a significant relationship between liquidity and overinvestment, the following recommendations are made:

1. Companies with cash inflow and outflow management are recommended to plan in a way that will not cause excess cash flow, as the excess cash flow of companies increases, the likelihood of overinvestment in projects increases.

2. Shareholders are recommended to invest more in companies that have a good liquidity management by examining the companies' cash flows in their analyzes

because proper liquidity can lead to efficiency of investment in projects.

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